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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 1. SAN FRANCISCO, SATURDAY, JANUARY 5, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

That Armor Plate.

Regarding the armor plate for the battle ship Oregon, referred to editorially in last week's issue, it may be further stated that the Government test was made on the 15th ult., at the Indian Head proving grounds. The plate was a seventeen-inch Harveyized nickel-steel plate, representing the forward thirteen-inch barbette of the Oregon. Members of the Naval Committee of the Senate and naval officers interested in ordnance matters witnessed the trial. The plate, which is one of thirteen forming a cylinder about the base of the Oregon's heavy turret, was not selected until the final treatment of all the plates it represented.

It is regarded by the Inspector of Ordnance, Commander Courtis, as the weakest one of the lot. It is twelve feet one inch long and eight feet four inches wide, and it weighs thirty tons. It was cast and forged previous to the test of the last heavy plate from Homestead, which was pronounced too soft, letting a Wheeler-Sterling projectile through it on the high velocity shot. The plate tested had been hardened more than the other and was regarded as being a typical Harvey plate. Owing to repeated assertions that the Wheeler-Sterling projectiles were better than other American projectiles, it was decided to test this plate with Wheeler-Sterling projectiles.

The first or cracking shot, an 850-pouud, twelve-inch shell, was aimed at a point five feet from the left end near the top, and on the edge of a soft strip intended for the purpose of securing the plate to the ship's deck. The charge was 278.30 pounds of powder; the velocity 1410 foot seconds, aud the energy 11,729 foot tons. The projectile penetrated fifteen inches and rebounded unbroken, shortened one-teuth of an inch and expanded in diameter eight one-hundredths of an inch. It spun violently on the ground, doubling up a heavy steel rail against which it happened to strike. The plate showed a crack extending from the right or ingot top end of the plate to the impact through the plate. This crack had apparently started at the edge of the plate aud run toward the impact, as it was fully half an inch wide at the former point and hardly open at the latter. The shot hole was also surrounded by a slight bulge in which were a number of radial cracks. This bulge, which was half an inch high and about thirty inches in diameter, indicated that the plate was somewhat softer than was desirable. It is to this reason that the penetration of fifteen inches can be ascribed.

The shot to determine the plate's resistanec to perforation was also a Wheeler-Sterling 850-pound twelve-inch projectile. The charge was 420 pounds of powder, the velocity 1858 foot seconds and the euergy 20,370 foot tons. This shot was aimed at a point about four feet from the top end of the ingot, thirty inches from the edge and twenty-four inches from the crack. The shell, after penetrating about ten inches, was shattered into minute fragments which rained down upon the proving ground for nearly a minute after it struck. The plate cracked from each impact to the upper edge, and the longitudinal crack was slightly widened. No bolts were broken or driven out, but the entire target was set back several inches, crushing some of the oak supports.

A rigid interpretation of the armor specifications would require the rejection of this plate and necessitate the successful trial of another plate before the $275,000 worth of armor could be accepted.

THE suspension of assessments was generally hailed as a satisfactory relief measure in '93; there was considerable difference of opinion as to its practical good in '94, and now comes up the questiou of the repetition of such congressional action for this year. The suspension helped thousands of individual owners and tided over many a man who would have been seriously inconvenienced to have had to do the necessary hundred dollars' worth of improvement on his claim. On the other hand, it kept from usual distribution some millions of assessment work, and in this way worked indirect injury to mining interests in general. The result has been very little assessment work done in the last eighteen months as compared with previous years, and it is questionable whether it would be wise legislatiou to re-enact the suspension bill in '95. Whether a gold claim or a silver one, it is more in the spirit of the times for owners, resident or non-resident, to have more development done. The required $100 simply complies with the letter of the law, and that much, and usually more, will be of benefit to each individual claim. There is great difference of opinion on this subject, as is always the case in matters affecting so wide an area, but the best interests of all and the proper development of the industry suggest that this year the law should not be suspended, and that the work of development be not checked. It is our belief that further effort in that direction would be unwise. As a matter of fact the suspension law has hurt the miner.

WIRE ROPEWAY OF THE ENGLISH MOUNTAIN MINE.

A Wire Ropeway.

The Vulcan Iron Works have erected one of their Wire Ropeways for the English Mountain miue, Nevada Co., Cal., to be used for transporting gold ore from the mine, situated on the side of a steep mountain, to a twenty-stamp mill below on the flat, a distance of 2800 feet, air liue, with an elevation of 600 feet. The nominal capacity of this line is 100 tons in ten hours.

This line, a partial illustration of which herewith appears, is not as remarkable as some other lines erected by the Vulcan Iron Works for leugth, high fall, long spans, etc., but is especially important in the fact that, were it not for this mode of transportation, it would be practically impossible to work this mining property, as the miue is situated on the side of a precipitous and rocky mountain and the expense of preparing any surface line dowu the mountain and across the lake would be enormous. In the region where this miue is located there is a snowfall of fifteeu to twenty feet, but such deep snow in no way interferes with the successful operation of this ropeway, permitting the active operatious of carrying the ore, to go on through the severest winter weather.

This line is provided with automatic loading and dumping machines, and being a gravity line, *i. e.*, the loaded buckets carrying the unloaded back, the cost per ton transported, is extremely low.

MANY causes are assigned for the financial stringency. On this coast the shrinkage in production may be pointed to as the principal one. Take California: The wheat crop of '80 was worth $40,000,000: the wheat crop of '94 is worth $13,000,000—a loss of $27,000,000 on that one product. The shrinkage in the value and quantity of Nevada's silver yield is another case in point. As compared with '80, it is within bounds to say that there is a diminished product of $50,000,000 in the two States. That is just so much less to spend, and that, too, among au increased population in this State. Were it not for the gold output of the State, matters would be much worse. The gold yield of '93 shows a haudsome increase over the previous year, aggregating $14,422,811, aud it is believed the total for '94 will exhibit the same gratifying result.

OBJECTION is often made to taking stock in proposed incorporations, that the holders of a majority of the shares have the power to levy assessments aud cause the sale of delinquent shares. It has been urged that a chauge is requisite in the State laws in line with similar enactments in some of the Eastern States, to the effect that where shares iu a stock company become delinquent by uon-payment of assessments, they stand as a debit against the stock so held, with interest, if so ordaiued, till paid; but that the delinquent stock could not be summarily sold. Such a law would interfere with auy "freeze-out" proposition, and would dispel an uncertainty that often exists under present rulings.

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J. F. HALLORAN.....General Manager

San Francisco, January 5, 1895.

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THE Victoria *Colonist* makes a stroug appeal for the establishment of a mining bureau in that provinee. British Columbia needs such an institution. Without a mining bureau, no State or provinee can expect to have its mineral resources properly developed.

THE *Chronicle*, iu its New Year's edition, gives a very good summary of the eondition aud progress of the State in '94. Its prophecies regarding 1945 make very pleasant reading, although it is always easy to create an atmosphere in which to flap the wings of fancy. The possibilities exist, the opportunity is ours, and the result will be commensurate with the effort made. "California and Its Possibilities" is a grand theme, and the *Chronicle* has done it justice.

A LARGE NUMBER of papers published in the interior of the State are advertising the best or quickest way to reach the South African gold fields. In this regard it should be generally understood that uo one should leave this State in hopes of improviug his financial condition in South Africa unless he has guaranteed to him by responsible parties, before starting, a good position at fair wages. Otherwise, he will be grievously disappointed.

THE extraordinary raiufall on the coast and in the valleys meaus the piling up of immense snow in the mountains. "The first snow that falls is the last snow that goes," aud the present wetness meaus abundanee of water for the miner uext season. The snow causes considerable present inconvenience. At La Porte, Plumas Co., last week it was ten feet deep on the level, and no mail had reached there for eight days. Near the Mountain House, on the road from Nevada City to Downieville, the snow was twelve feet deep ou the stage road.

THE recent sale of the Oregon Pacifie railroad for $100,000 illustrates the uncertainty of railway investments and the folly of puttiug good money into a scheme not thoroughly uuderstood. Begun in 1880, when Heury Villard was acquiring possession of the Columbia river, the Oregon Paeific people started a railway from an alleged port at Yaquina, Or., toward the Willamette valley, with the announeed program of completion 600 miles to Boise, Idaho. The enterprise was backed by New Jersey capitalists, who said the ultimate intention was to have Eastern transeontinental connection made. A line of steamers was put on to this eity, and the projeet was widely boomed. First and last the work cost about $11,000,000. There are outstanding $15,000,000 of bonds, several additional millions of stock, and about one million in unsecured debts. The stock is valueless, and should the bondholders hope to get anything back on their investment they must advanee a great deal of money. All there is to show for the vanished millions is 147 miles of railway. The trouble was lack of water at Yaquina.

THE Boston *Transcript* thinks "Moribund Nevada's two Senators for 40,000 people are the shame of the uation." The natiou has shames, but Nevada's Senators are not of them. If it be redistribution that our Boston brother believes in, what shall his basis be? Rhode Island, like Nevada or auy other sovereign commonwealth, has two Senators. If on a basis of population, then the East will suffer thereby. New England has fourteen Seuators now. Illinois has two; but, if the New Englaud basis is the correct one, Illinois should have ten, and other States are in like proportion.

W. S. STRATTON of Cripple Creek, Colorado, is the latest mentioned iu connection with the United States Senatorship from the Centennial State. In the last two years he has risen from financial obscurity to promineuce. Jas. Haggin had an opportunity to have some of the Colorado man's present wealth, but was a little slow. One big mining property was offered Haggin by Stratton about fifteeu months ago for $155,000. The financial flurry made him temporize, but he sent a trusted friend to make inspection of the property, who wired him the mine was easily worth half a million. Haggin telegraphed Stratton the same hour that he would give $350,000 cash for the property, but the answer flashed back was: "One million wouldu't buy it."

THE continued decline in the price of silver during '93 and '94 has caused mueh comment on the futurc of silver mining. The *Tribune* says that, in Utah, consolidation is proposed. With the decline in the price of the metal the profits are shrinking so fearfully as to endanger the existenee even of the largest and richest properties. Already hundreds of the small mines, which were making money two years ago, have surrendered and given up the business. Sueh fate will overcome the larger mines unless steps of some sweeping sort, amouuting almost to a revolution in methods, can be devised. Those steps, say some of the leading miners, must be in the direction of the eonsolidation of iuterests. Silver mines in given loealities must unite in the same manner that so many other industrial enterprises are uniting. That will make sueh a reduetion of expenses possible as will partially offset the terrible decline in priee which has been taking place since the panic. It will also fortify the producers as against the smelters aud refiners, and in that way, if it were to be iu no other, effect a considerable ehange from present couditions.

AMONG other matters decided at the recent State election there were several constitutional amendments voted upon affirmatively, one relating to the foreign ownership of real estate in California. Section 17, Artiele I of the State Constitution has been by popular vote ameuded so as to read as follows:

> Section 17. Foreigners of the white race, or of African descent, eligible to become citizens of the United States under the naturalization laws thereof, while bona fide residents of this State, shall have the same rights in respect to the acquisition, possession, enjoyment, transmission and inheritance of all property, other than real estate, as native-born citizens; provided, that such aliens owning real estate at the time of the adoption of this amendment may remain such owners; provided, further, that the Legislature may by statute provide for the disposition of real estate which shall hereafter be acquired by such aliens by descent or devise.

From London comes the inquiry: "How will this affect English ownership of California gold mines? Are not gold mines 'real estate'?" Accompanied is an implication that the recent voice of the people so vociferously expressed may result in cessation of purchase of California gold mines by the British iuvestor. On the assumption that the next best thing to having our mines owned and operated at home is to have foreign capital so engaged, it were unwise to put auy obstacles in the way of "foreigners" investing and profiting by such investments here. Gold mines eome under the heading of real estate, but it is not at all likely that the Legislature whieh meets next week at Sacramento will take any further action inimieal to the foreign investor in gold mines or other real estate in Californiа.

The Money Question.

The currency question, the issue of bonds, "free eoinage," etc., take up the public thought in and out of Congress. Many plans are offered, the one now before the House, known as the "Carlisle plan," and which deserves defeat, being the one receiving the most present attention.

In the discussiou of a question two things must be observed: What is the question, and on what points do well-iuformed persons agree?

On the money question all intelligent men agree that a contiuued increase of circulating medium causes the general level of prices to rise and a contraction of currency causes a shrinkage in prices.

What is the free coinage of gold and silver? It has been so often misstated that it is well to state it fully. The Governmeut of the United States alone has power to say what shall constitute a legal tender in the payment of debts, aud to determine the relative coinage value of gold and silver. What is meant by free coinage is simply this:

The Government will eoin all the gold bullion brought to the mint so many grains to the dollar, charging therefor, if it sees fit, a mintage charge, and the owner of the bullion takes the gold dollars his bullion makes, and takes his own chances of circulating them. Such is the law to-day. If we had free coinage of silver, the same thing would obtaiu as to silver bullion. The owuer of silver bulliou would take his bullion to the mint and have it coined into silver dollars (the Governmeut making a mint charge), the owner of the bullion receiving silver dollars and taking his own chances of placing them in circulation. In neither case does the Government buy the bullion.

What then beeomes of the favorite assertion so ofteu made that, if we have free eoinage of silver, the owner of silver bullion will bring his silver here and sell it to the Government for gold? It is not the case, for the Governmeut does not buy it, nor have anything to do with it except to coin it, deducting a mintage charge and making by law the dollars a legal tender. The owner of the bullion has on hand the same bullion he puts in the mint, changed in form and less in amount equal to the mint eharge.

It is again stated that to do this is to repudiate our government contracts. This is not so.

All the bonds of the United States, even those recently issued, are payable in *coin* (they do not say gold coin) of the weight and standard of fineness of July 14, 1870. We find, then, under the law of 1870, gold and silver were full legal tender at the ratio of 16 to 1, the silver dollar being 412½ grains, nine-tenths fine, and the gold dollar being 25.8 grains, nine-tenths finc.

In what mauner would it be repudiation to pay our bonds just as we agree to?

As to the effeet: If we have gold alone, or a limited amouut of silver, the effect is to cause a steadily decreasing amount of money, for the output of gold does not keep pace with the amount used in the arts and worn out and lost, and with the eonstant inereasc of population the effect on prices is to eause a constant decline, the men with fixed incomes from bonds and life salaries being correspondingly benefited, and the burden of paying the public debt being correspondingly harder.

If we had free coinage of silver as well as gold, the circulating medium would either increase, or at least the tendeney to further deeline would be checked. Objections are urged to the coinage of silver, but they are all based upon prophecies, and they are the same that were once made to the coinage of gold in Europe in 1857, when gold was demonetized by the most of the leading nations of Europe. They are the same prophceies that were made in 1878 in Congress, when the Bland bill, providing for the coinage of $2,000,000 a month, was on its passage.

Not one of the evils so eloquently prophesied in 1878 occurred. Then men should cease their prognostieations of evil or, at least, sometimes make a prediction that eomes true. Can we do this thing alone? In the struggle for gold alone we are strong enough to enter the race. If we ean do that we eertainly ean be an independent nation. If our exports exceed our imports money must come to us. If our imports exceed our exports we must in time become bankrupt under any system.

Money Asked For.

The committee for the protection of mineral lands is having printed 5000 pamphlets to be sent to the miners of the State, setting forth the facts in the present effort to stay pending action and secure such legislation as will enable the miner to stand on more equitable terms as to the selection and disposition of public land. Much of the contents has already appeared with endorsement in these columns. The motive of the present distribution is to show the present status of the matter, illustrate the necessity for prompt action and direct attention to the fact that money is needed to bring the movement to a successful issue.

The pamphlets, which will be issued next week, contain the following appeal:

To the Miners of California: Until the organization of the California Miners' Association, a few years ago, united action on the part of the miners of California was practically impossible. Now, however, with branch miners' associations in the mining counties (all of which are represented on the executive committee of the main association), the miners are in a position to make their wants known as a body and bring their grievances before the Legislature or Congress with some assurance of attention being paid to their requests. At the annual miners' convention the delegates are enabled to instruct the executive committee as to the course to be pursued during the year, and to various sub-committees are intrusted the responsibility of carrying out the resolutions of the convention.

Owing to the exertions of the California Miners' Association a radical change has been made in the Federal laws relating to hydraulic mining in this State, under which these mines, long closed down in certain sections, may again, under prescribed conditions, resume work and become profitable, giving employment to many men. The Miners' Association now has on its hands a struggle to effect certain changes beneficial to the miner, on the laws relating to quartz and drift claims. It is also endeavoring to prevent further encroachments on the public mineral domain by agricultural or railroad claimants, so as to keep for the miner the heritage which is his due.

To carry on this work properly and accomplish the results desired by the convention money is absolutely necessary. With the single exception of the secretary, who has abundant work to perform, no man in the association receives any salary or money, the work being all done voluntarily by the executive and other committees. It is, however, necessary to employ people to prepare maps, look up records and perform other services for the committees. A great deal of printing is also necessary, and money is needed for that. It may also be necessary to send some one to Washington on behalf of the Miners' Association to look after our interests there. We ought to have a fund on hand for such emergencies as are apt to occur. Without money it is impossible to carry out the wishes of the association.

All this work is being done in the interest of the mines and miners of California, so in helping the association with funds the miners are helping only themselves. With the changes in the laws we are advocating will come better times throughout the mining regions of the State, more investments of money and the consequent employment of more men. The miners must themselves put their hands in their pockets if they wish to see anything accomplished. The hands of the executive committee are tied when they have no funds to carry on their work.

Those opposed to the interests of the miners are abundantly provided with money, lawyers, and facilities of all kind to accomplish their ends, and if we are not measurably equipped in the same way we will have an up-hill fight and be liable to accomplish little. Not a cent of the money collected for the purposes of the association is wasted or extravagantly used. Those who contribute may rest assured that the funds are carefully guarded, and account given of all expenditures. The amount on hand now is less than $100 and there is need for at least $1000 at once for certain expenses incurred. Other similar expenses are bound to follow and we should have several thousand dollars in the treasury.

According to the report of the State Mining Bureau this year there are upward of 13,000 miners employed in the mines of this State. A contribution of $1 each would provide an abundant fund to carry on the Miners' Association for some time. If superintendents and managers of mining properties would make a very slight effort to explain the objects and purposes of the association and its needs, the men would willingly contribute their share. Merchants and storekeepers in the mining towns should also be called upon to assist the movement. The county associations, through their officers, should appeal to the members to aid the good work.

Appended to this are certain documents showing, among other things, what other mining States are doing in the direction of saving the mineral lands for the miner. It is in direct line with the work California has before her, and upon which the association has a committee now engaged. It would repay every miner in the State to read these statements, as they show the danger we incur of being apathetic or postponing action on matters relating to the mineral lands. All these matters must at once be brought to the attention of the Government authorities in as forcible a manner as possible. Delay at this time means a forfeiture of thousands and thousands of acres of mineral land. The miners can keep this land for themselves if they make a united effort, but if they fail to do so it will be their own fault. The State Association is in a position to represent the miners' interests provided it is furnished with the necessary funds to carry on its work.

Obituary.

JAS. G. FAIR, ex-Senator from the State of Nevada, and a miner known the world over, died at the Lick House in this city on the night of the 28th ult., in the 64th year of his age. Born in Ireland in 1831, he came here at the age of 19, and mined with varying success, till he, with Mackay, Flood and O'Brien, secured control of the Virginia City mines, that yielded them $150,000,000. The stories told of "Uncle Jimmy Fair" are countless. He was a hard worker, a shrewd manager, a good practical miner, the best, in fact the only real miner in the big quartet whose riches made them famous. While luck had a great deal to do with his results, he was that style of man that left little to chance, but so acted that everything would come his way unless all known laws of circumstance failed. He was a power in the mining world, the biggest of big operators in the Stock Exchange, and his nerve and financial ability were such that he could withhold and overcome the greatest of financial flurries. As a money maker he was a gigantic success: his estate will probably aggregate $30,000,000. Twenty-five years ago he was a poor man; ten years ago he was reckoned at $15,000,000. His real estate and mining investments all turned out well, and the only place he made other than a great success was in the U. S. Senate, where, like Stanford, he never felt at home, not being able to say or do what he liked.

In every department of industry he had big investments, and he gave constant employment to an army of men. He did a great deal for this city, spent millions of dollars in industrial enterprises here, improved his real estate, and kept money constantly moving.

His millions go to his three children, Mrs. Oelrichs, Miss Fair and Chas. L. Fair, but are so curiously tied up in his will that they practically have only a life interest in his wealth.

Concentrates.

THE Montana Ore Purchasing Company has declared a dividend of $40,000.

THE "Minnesota Gold Mining and Refining Co." have been proved to be frauds.

THE Starlight mine, El Dorado, has been sold to G. C. Hawley of this city for $25,000.

THE White Swan mine, near Baker City, Or., has been sold to Des Moines, Iowa, capitalists.

THE Boston & Colorado Smelting Company paid a 2½ per cent quarterly dividend on the 2d.

A "STRIKE" is reported in the 1600 level of the Maryland mine. The lodge is about twenty-five inches in width and shows free gold.

THE Redding *Free Press* says: "The Gladstone mine at French Gulch has settled every dollar of indebtedness, and is ready to turn out bullion."

THE Sioux mine, at Tintic, Utah, has been sold to F. Farrell, of Ansonia, Conn. A big reduction plant will be at once built, including a 100-ton concentration mill.

C. G. W. LOCK and Thomas Hall of Deadwood, S. D., have sold to the California Picacho Gold Mines Company the Ruhy placer claim in the Picacho district in San Diego county.

THE Congress mine, Arizona, has been sold to the syndicate headed by E. C. Gage, who is at present in charge of the property. It is understood that the price paid was $1,000,000.

NEW MEXICO'S mineral output in 1894 has not yet been officially figured up, but the most reliable data show: Gold, $1,500,000; silver, 1,250,000 ounces; lead, $80,000; copper, $50,000.

THE Indian Creek L. & M. Co. are working the Shaw mine, near El Dorado, and will shortly build a 50-stamp mill. Nearly a quarter of a million was produced by the Shaw mine in days gone by.

THE Secretary of the Interior has approved the lists of land selected as indemnity by the Northern Pacific railroad, embracing about 200,000 acres in the Minnesota grant and 300,000 in Montana.

THE Horse Shoe Gold Mining Company, of Wardner, Idaho, has incorporated; capital stock, $1,000,000; officers: F. Jenkins, president; G. W. Harris, vice-president; H. Drought, treasurer; H. A. Jones, secretary.

IN the mineral production of Idaho for 1894 the totals are: Gold, $,879,000; silver, $2,359,000; lead, $3,606,000; an aggregate of $7,884,000. Silver is figured at sixty cents an ounce and lead at three cents per pound.

THE Consolidated South Spring Hill Gold Mining Company has incorporated, and John R. Tregloan is superintendent. They will work the Median mine at Amador City. The incorporators are residents of Portland, Maine.

THE directors of the Harqua Hala mines have transferred to Wickenburg the shipping of supplies to their property. The road is by way of Cullen's wells, the only drawback being the lack of water on a stretch of forty miles after leaving Wickenburg.

THE electrolytic plant of the Boston & Montana Company at Great Falls, Mont., which was originally expected to produce 800,000 pounds of copper per month, is reported producing more than twice as much and at a very slight increase in cost.

CHICAGO PAPERS quote C. M. Kepp of Milwaukee, a shareholder in the Gem mine, as saying that an English syndicate is likely to purchase the Gem, Frisco, Tiger and Poorman mines of the Cœur d'Alenes. The consideration named is $3,000,000.

THE Osceola Copper Mining Company will pay a dividend of $1 per share on the 15th, the first since December 30, 1893, when a similar amount was paid, and also $1 on May 5, 1893. The dividend payable on the 15th will make a total of $1,897,500 to that date.

A. GROTHE, of Payette, Idaho, who recently returned from London, succeeds J. C. Kemp Van Ee as manager of the Poorman Mining Co.'s mines at Silver City, Idaho. A new mill will be built in the spring, and it is understood that a development fund of $150,000 is available.

THOUGH silver is but sixty cents an ounce, Tombstone, Arizona, is said to be turning out 150 tons of ore weekly that brings back from the smelter between $9000 and $10,000. In addition to this, her miners are piling up reserves of ore for the time when silver shall be rehabilitated.

THE Columbia River hydraulic mine is now owned by the American Development Company of Duluth, Minn. The property consists of the Discovery claim of 65 acres and 160 acres adjoining, together with a water right, in the big bend of the Columbia about 75 miles north of Revelstoke, B. C.

TEXADA ISLAND gold is the subject of discussion in Nanaimo. Several excellent specimens have been exhibited showing a considerable quantity of free gold; but to experienced eyes it looks a trifle too much like the product of a "specimen mine" with a vein so small as to require almost solid metal to work.

SHELBY ELI DILLARD asserts that "the great trouble with the majority of prospectors is that they are afraid to use the pick and shovel. It takes plenty of hard work and good judgment to prospect for mineral. This thing of going to the mountains and laying in camp and eating three meals a day and telling old-time stories about what was found in California forty-nine years ago, is only mythical gold hunting. It takes a brave heart and bull-dog determination to get rich in the mining business, and people who are not endowed with such characteristics had better leave mining alone."

THE Rosemont, Arizona, copper mines have closed down. Very little development work has been done on the property, and it was found to be a piece of folly to try to maintain an eighty-ton smelter running on surface ore. This is but another instance of the uselessness of erecting reduction works before having a mine.

THE Interior Department decides that 128 acres of land, upon which most of the residence houses of Cripple Creek are located, has been declared placer ground and the ownership awarded to half a dozen claimants. There are about 500 houses on the claim, and the owners will have to pay for the land they occupy or move off.

THE Little Larb Hills, near the Choteau county line, in Valley county, Montana, is the scene of the latest gold find. It is thought there that the new gold fields will prove as great a source of wealth as did the deposits at Alexander City, near Glasgow, last spring, when all Montana was threatened with a stampede.

As elsewhere, the closing of the silver mines, caused by the low price of silver, has resulted in a marked increase in the gold production of Arizona. The gold output during the year was $2,080,250; the silver output $1,700,800; copper, 48,270,500 pounds. The total output of these three metals for the last eighteen years is valued at $101,784,017.

A BUTTE, Montana, mining broker is told in a letter from Liverpool, England: "The mention of a gold mine or any other kind of mine to a Liverpool man is fraught with danger. Liverpool has suffered fearfully by mining ventures, especially during the Australian craze of 1888, 1889 and 1890, when shares sold from £2 or £3 which now cannot command as many shillings."

MAJOR NEWELL, who is the inventor of a scheme to raise gold-bearing gravel from the bed of a stream by means of a strong suction pipe and extract the precious metal therefrom, has launched his craft on Rogue river, near Grant's Pass, Or. The boat is thirty feet long by twelve wide, and is fitted with an engine and boiler to run the pump and a set of sluice-boxes to wash the sand and gravel after it has been raised to the surface.

THE Southern Pacific Railroad Company has filed in the Visalia Land Office a list of land situated in the Visalia district and has applied for a patent for the said lands. The total for the district amounts to 65,529.90 acres, which are in townships 25 S, and 29, 30 and 32 E; 26 S, 29, 30 and 32 E; 27 S, 32 E; 29 S, 21, 22 and 23 E; 30 S, 21, 22 and 23 E; 31 S, 22 and 23 E. Those interested in these lands must put in their protests, and file them in the Land Office at Visalia before the 28th inst.

Two years ago a contest was begun in the Spokane, Wash., local land office against issuance of patent to the Oro Fino placer mine, owned by S. I. Silverman. The local officers rendered a decision against him. He appealed to the Commissioner, who reversed the findings of the local officers. The case was carried to the Secretary of the Interior, who reverses the Commissioner and sustains the original decision. The case is especially important to the town of Loomiston, which is laid out on the placer claim.

THE Nevada Southern railway, a branch of the Atlantic and Pacific, is now completed to within a few miles of the southern boundary of Nye county, Nev., and the contractors expect to enter that county early next spring. There are large deposits of gold and silver-bearing ore in Nye and Lincoln counties, carrying from $30 to $60 per ton in gold and silver. This ore cannot be worked profitably until cheaper transportation facilities are obtainable. The completion of the Nevada Southern railway will result in the development of the mines of Nye and Lincoln, and there will be a large immigration to those counties next year.

THE following articles of incorporation have been filed with the County Clerk of Amador county: Articles of incorporation of Consolidated South Spring Hill Gold Mining Co.; capital stock, $1,500,000; amount of stock paid for, $35; par value of the shares is $5; located at Portland, Me. Lone Hill Mining Co.; capital stock, $150,000, divided into 75,000 shares—par value $2 each; place of business, Sacramento, Cal.; to exist fifty years. Reward Gold Mining Co.; capital stock, $1,000,000, par value $10 per share; capital stock subscribed, $25,100; place of business, San Francisco; to exist fifty years. Amador Railroad Co.; capital stock, $100,000, par value $100 per share; capital stock subscribed, $12,400; place of business, Amador City, Cal.; to exist fifty years.

THE Leadville, Colorado, *Herald-Democrat* gives the total output of that camp for 1894 at $8,160,074. If silver had been at its coinage value the output would have amounted to $13,000,000. Of the 1894 output, the production of gold amounted to $1,934,240. This, says the *Herald-Democrat*, is certainly an excellent record for a gold camp but a year old and with but three gold properties practically producing at this time. The gold output for 1893 was only a little over $803,000. The tonnage of the camp for 1894 as given is 362,907 tons, which is an increase over 1893, when there was but 340,000 tons of ore brought to the surface. The great Smith-Moffat group, including the Maid of Erin and Gray Eagle, consolidated, has taken out 10,000 tons more than last year, and many of the other older properties show a like increase. The grand total of the yield of Leadville mines from 1879 to 1894, inclusive, is $196,449,447.29. The number of men engaged in mining, hauling and smelting ore, as furnished by the superintendents of the different mines, is divided as follows: Miners and mine laborers, 2231; smelter hands, 650; ore haulers, 150.

Personal.

M. BOOTH succeeds Mr. Bache as assayer for the Treadwell company.

JOHN GILL succeeds M. G. White as foreman of the Granite Hill mine, Nevada Co.

W. M. NESBIT SR. will take charge as superintendent of the Mammoth mine at Tintic, Utah.

MRS. PHŒBE A. HEARST of this city has provided for the miners of Lead City, S. D., a library and reading-room in the new building of the miners' union.

F. B. PLEBY, a mining expert for Senator J. P. Jones, has gone to Mexico at Metlakatla to look over the late gold discoveries in quartz on the north side of Annette island.

The Cyanide Patents.

To the Editor:—Serious misapprehension appears to exist in some quarters respecting tbe effect and scope of tbe recent decisions of the English courts against the plaintiff in the suit brought for infringement of one of the MacArthur-Forrest patents.

Preliminarily, it should be observed that tbis decisiou was by a single trial judge, and at what may be regarded only as the commencement of the litigation. Such initial decisions are far from conclusive, and are subject to revision and reversal by the Court of Appeals composed of several judges, and after tbis again by the House of Lords, where many a patent has been sustained after being invalidated below. In fact, it may be stated almost as a rule that in cases involving difficult chemical processes, like the MacArthur-Forrest patents, the invention rarely comes to be fully understood and its merits recognized and rewarded until after the full and repeated discussiou and study arrived at in the higher and appellate courts as compared with the hurried first conclusions of the trial below. A striking instauce of this is afforded by the history of the Tilgman patent in this country for reducing fatty acids by a chemical process. That patent—in many respects closely analogous to the MacArthur-Forrest patent—was first held to be void, not only by the courts below, but even by the Supreme Court of the United States (See report of Mitchell vs. Tilgman, 19 Wallace U. S. Reports, 287). One would suppose that the Tilgman patent was finally disposed of after an adverse decision by the highest appellate tribunal in this country, and that those wishing to use the process might thereafter do so with impunity. But tbe exact contrary proved to be tbe case, for in a few years afterward, in another suit, the Tilgman process again came up on appeal before the same Supreme Court; but on this second occasiou the court, having become better instructed as to the nature of the invention and its great utility, actually reversed its own prior decisiou and sustained the patent in the broadest possible way (See report of Tilgman vs. Proctor, 102 U. S. Reports, 707).

However, there are many other reasons besides the possibilities of the appeal why the English decision should not in any sense be depended upon as weakening in any way the right of the owners of the MacArthur-Forrest patents in this country to insist upon the recognition of their rights. The only question presented in the English court arose on the broad claim to the exclusive use of a cyanide of potassium solution for extracting gold from ore. The second or more specific claim to the use of the solution, after the manner and in the proportions which seem most useful as invented and disclosed by Messrs. MacArthur and Forrest, was not involved in that case. The whole sum of the decision was merely that, so far as this first trial judge could see, Messrs. MacArthur and Forrest were not entitled to the exclusive use of every possible form of cyanogen and of cyanide solution. The claim of the American patent is, as is well known, narrower and more specific than this broad English claim, and is carefully limited so as to cover only a specific strength of cyanogen, which latter, it may be added, is the only kind of solution which has been found effective in this country. There is, therefore, no ground for supposing that the English decision constitutes any precedent which will control or even affect in any way the result of the suits against infringers on the American patent, which are now under way.

Furthermore, it should be borne in mind that the MacArthur-Forrest process is not, as patented, merely for the use of cyanide of potassium. The use of cyanide constitutes only one feature of the invention, and this was the only part of it involved in the English case. As will be well understood by those familiar with the process, other additional features of great importance are covered by the patents, among which may be noted the present admirable method of precipitating by the use of zinc shavings. Though other methods of precipitation are open to the public, this particular one is covered by a patent, the validity of which is believed to be unchallenged. It should be said, in conclusion, that no patent of any distinguished value has ever run its career without the most violent opposition and question as to its validity, and that it cannot be anticipated that these patents shall enjoy any exemption from this general rule.

Considering the enormous value and utility of the process as demonstrated by the actual figures of those working with it, and on the undisputed fact that no one ever actually brought it into use until Messrs. MacArthur and Forrest published it, it would seem but just to accord to them, as a slight reward for their patenting and thus teaching to the world that which otherwise they might have kept as a secret process, the few years of monopoly during which they may get some return through the moderate license fees, on payment of which the process is freely opened, with fullest instructions, to all the mining world.

It does seem incredible that these inventors should have been anticipated by others when it is considered that no problem has received keener or more constant scientific and practical attention during the last fifty years than this—of how to extract from ores the percentages of gold resisting amalgamation, chlorination and other processes, and that the scientific publications of Faraday, Gemlin and others, and the patent of Rae, relied upon as anticipations, were all on the books for more than thirty years, notwithstanding which no one knew enough to make any use of such publications until *after* Messrs. MacArthur and Forrest had demonstrated the enormous utility of this process. The fact is, that none of these publications disclosed what MacArthur and Forrest subsequently taught, and that were it not for the latter the mining world would today be just where it kept for thirty years, notwithstanding all those publications stared it in the face during the entire time. H. Bankart, M. E.

San Francisco, Dec. 26, 1894.

Eastern Oregon Prospects.

To the Editor:—The mining fields of the Northwest have been unusually active for the past three years, and during that time many valuable discoveries have been made and transfers of mining property numerous. True, the debasement of silver had a very disastrous effect upon certain productive districts, but even this state of affairs did not deter the prospector from searching for silver lodes. The feeling that sooner or later the white metal would receive recognition that would place it on equality with gold encouraged him in his explorations. The general character of the ore in this section of the western mineral fields, even in the face of the great decline in silver, stimulated the searcher for wealth owing to the fact that the silver-bearing districts carry a paying percentage of gold. Many of the best paying mines throughout the Northwest, though predominating in silver, depend mainly upon the diffusion of gold throughout the ore for profits, and but for which such properties could not be successfully operated. The mines at De Lamar are a striking illustration of this fact, the gold product being in excess of running expenses.

In this section of Grant county this characteristic of ores prevails, and though the old parity of the two moneyed metals should never be restored there is sufficient wealth in the ores where large bodies of it exist to insure productive and valuable mines. If this mineral belt existed in any of the more favored States and Territories it would long ago have been an important factor in the world's product of both gold and silver, but for reasons of a financial nature ledges of the most promising description were not sufficiently prospected to prove the extent and value of ore bodies and of course could not be represented to mine buyers as they deserved to be. In nearly every instance where thorough development has been a feature paying ore bodies have been unfolded, and that, too, in mines where croppings showed but little mineral. The La Belleoue, one of the most prominent mines in the district and now operated by a strong syndicate, is corroborative of this fact.

The Greenhorn mountains are undeniably rich in minerals, and it is only a question of time when development will demonstrate the existence of ore bodies of incalculable importance to the mining world. The belt is extensive, the ledges large and running parallel, and so close together that in some instances five or six ore-bearing veins exist within the side limits of a location and an opening on any one of them would suffice for operations on the entire group. The ores are, however, refractory and would therefore necessitate roasting; but in a country so densely timbered, the output of the mines can be treated in this manner at comparatively light cost. As a general thing, ledges in high altitudes very rarely carry much gold, but here it is an exception. The ore is very similar to that in the DeLamar mines in Idaho and would require the same treatment, but owing to far superior natural advantages, the cost of reduction would be nominal compared with the expense attending the ores in the mines above mentioned. Again, nearly all the discoveries made can be opened at great depth through the medium of tunnels, cross-cutting the country or projected along the veins, thereby opening up long-lasting ore bodies and precluding the employment of pumps and other machinery necessary where properties are operated through a shaft. No opening of sufficient depth has as yet been made to fully demonstrate the nature of the country, so far as water is concerned; but even though the formation should hold quantities of it, a long time must elapse before the stoping territory above a tunnel level would be sufficiently exhausted to necessitate sinking.

Nature could not have done more in the shape of natural advantages for the successful working of the properties, even though Providence has taken especial efforts to do so. As before stated, the mountains are densely covered with the best of timber for building and mining purposes. Water is plentiful, and fall can be obtained for running any machinery of whatsoever nature for working the mines or treating the ores. The snowfall, though probably reaching the depth of seven or eight feet, will be no obstacle in mining, the roads being easily kept open. A fine mountain highway leading from either Baker City or Canyon City via Granite, penetrates the Greenborn country, and from which branch roads run to the different mines. By the way, there is a narrow gauge railroad running from Baker City to the village of McEwen, a distance of twenty miles, and your correspondent has been informed that this road will be extended to Fort Sumter next season, thus bringing Granite within fourteen miles of railroad communication and the Greenhorn mining district within thirty-two miles of the railway terminus.

The entire country is picturesque; the mountain scenery is embellished here and there by beautiful lakes filled with the finest trout, while in every direction little streams wind their way, all of which are well stocked with speckled beauties. Game of every description natural to this latitude is plentiful. The climate is delightful, and, viewed impartially, it is undoubtedly one of the most interesting mining camps on the continent.

Though but a few years have been devoted to prospecting in this district, a number of fine locations have been made and nearly all of them have received more or less development. The "Intriusic," operated by a Portland, Oregon, company, is a fine property, located on the east side of the mountain and distant from the old town of Robinsonville about two and one-half miles. The ledge is a large one, the ore being gray copper carrying gold. Five tons of ore were shipped from this mine that returned an average of 112 ounces in silver and $5 per ton in gold. The Silver Hill, owned by Schuarr & Hann, also has a record as a high-grade mine, in the neighborhood of fifty tons of ore having been treated that yielded 268 ounces in silver and $5 per ton in gold. Messrs. Miller & Morris are developing a mine known as "Morris," that promises to become very valuable. The mine is opened through a tunnel and several hundred tons of ore have been extracted and shipped that yielded $48 per ton in gold and silver. The "Ornament" comes next in rotation and is also operated by a Portland combination, the ore being of the same character as that in the mines above mentioned. The Bennet claims, in the same vicinity, have been developed to some extent and all the ore tested has yielded well. The Ruby and Chloride mines, located near the head of Boulder creek, are other properties of great promise, and during next season will be operated for all they are worth.

On the north side of the mountain a stream, known as Lost creek, finds its source, and on the headwaters of this creek is located one of the best mineral belts in Oregon. Within a comparatively small area of territory twenty veins have been prospected, all of which show remarkably well. Prominent among this number are the Yellow Jacket and Salmon, owned by J. N. Manley and C. H. Williams, and the Mossback and Cora, owned and operated by J. H. Hilliard, John Coyle and W. P. Mount. In the latter locations nine mineral bearing ledges, ranging from three feet to six feet in width, have been found within the side lines of the claims and they are so situated that one opening will answer for all of them. The ore from these properties has been thoroughly tested and in every instance the returns have been most gratifying. Shafts have been sunk here and there along the veins that have demonstrated the surface existence of an ore body 300 feet in length. The character of the ore is the same as in all the other mines mentioned, but the great volume of mineral-bearing quartz in sight will ultimately bring these two properties into prominence in the mining world. It is a safe prediction that the time will come when the Mossback and Cora will contribute largely to the gold and silver output of the northwest, but capitalists must become identified with their development to bring about a realization of this prediction. Those who are in search of mining investments could not find a more encouraging field to operate in than the Greenhorn country. If the claims above mentioned were in any of the more favored mining districts they would long ago have been pouring their wealth into the channels of trade and a lively, prosperous camp denoted on the map.

Next season will be one of great activity throughout this entire district, and if indications are a safe criterion to be governed by, many valuable properties will be opened up before the return of another winter. R. C. G.

Granite, Or., Dec. 25, '94.

Laboring in High Altitudes.

Some curious facts are brought to light on the capabilities of men to labor at high altitudes during the construction of the Peruvian Central Railroad. This line starts at Lima, and proceeding inland, reaches its highest point at the tunnel of Galeria, 15,645 feet above sea level. It is stated that men were able to do a fair "sea level" day's work as long as the altitude did not exceed 8000 to 10,000 feet above sea level; but beyond this there was a sudden falling off in the work of one-fourth to one-third up to heights of 12,000 feet, and at still higher elevations 100 men were required to do work easily done by fifty at sea level.

Mining in Nevada County, Retrospective and Prospective.

Written for the MINING AND SCIENTIFIC PRESS by SAMUEL BUTLER.

It is customary for the careful and diligent man of business at the close of the year to sit down and balance up his accounts. In a dispassionate manner he ponders over his business and financial accomplishments during the year. He is retrospective, and carefully reviews the past. His future actions are guided in a great measure by his past experience. It is true that he may anticipate emergencies during the year on which he is just entering, and with the instinct of the true business man he makes proper provision for the same. But, nevertheless, he is almost entirely governed by past failures and successes.

The object of this writing is to take a calm and dispassionate retrospect of the past and to make some feeble suggestions relative to the future of mining in Nevada county. In doing this my words and opinions will be influenced to a great extent by what we have accomplished in the past through the different systems of mining in vogue here. This is the only chart we have by which to measure the future extent and prosperity of our great industry.

Nevada county bears the proud distinction of being the banner gold-prodneing county of California. Other counties have attempted to compete with her in the race for snpremacy, but when the yearly productions were put to the keen analytical test the disparity was very obvious. The suppression of hydraulic mining was of more serious consequence to Nevada than to any other couuty in the State. A careful estimate reveals the fact that through the inhibition of this system of mining this county was deprived of an annual revenue amounting to $3,750,000. The total production of our hydraulic mines up to the time of the suspension of operations through the decrees of the courts aggregated the magnificent sum of $112,000,000. The great injury received must therefore be apparent to all intelligent minds. But in spite of this disparagement we have continued at the head of the procession, and have always been found in the vanguard of progress. Our mines have been developed more successfully and to a greater depth than the mines of any other section of the State. No similar area in the world has paid more magnificently, considering the amount of capital invested, than that which comprises Nevada county. But there is yet room for judicious investment, the only thiug necessary to success being capital. "Money makes money," and without this essential requisite the speculator cannot succeed more successfully here than elsewhere.

The year 1894 dawned more auspiciously in this county than any previous year since the prohibition of hydraulic mining. The skies were exceedingly bright. Success beamed in every town, village and hamlet in the county. The anticipated resumption of hydraulic miuing aud a marked improvement in quartz mining imparted enthnsiasm to every resident. The previous year—1893—had witnessed the most disastrous financial depression ever recorded in American history. Gloom and depression were everywhere prevalent. But notwithstanding this fact and while the panic was ravaging the country from Maine to California, causing disaster wherever it entered, onr people viewed the result with almost stolid indifference, secure in the knowledge that while other industries were languishing and being forced to the wall through the great depression, our prime iudustry was rapidly increasing in extent and in the amount of production. Congratulations on the enjoyment of such an era of prosperity while the rest of the world was being degraded through commercial and financial depression, were very nnmerons. In my correspondence to the PRESS at that time I referred to the prosperous era in the following language: "The prospects for quartz mining were never brighter than at the present time. Increased interest is manifested by outside capitalists, and we predict for the year 1894 an era of nnprecedented prosperity."

During this year the North Star mine increased its output by over $100,000. Most of the other large mines—the Maryland, Omaha Con., Empire, W. Y. O. D., Champion, Providence, Nevada City and Monntaineer—were producing exceedingly well. They were being operated on sonnd business and financial principles; but a check to this unequalled prosperity came all too snddenly. It came in a manner, too, which sent terror to thonsands of uoble and courageons hearts. On the evening of Jannary 9th the protracted shrill of a mine whistle aronsed the residents and betokened danger. Investigation proved that a fire had started in the changing room of the Maryland mine and had qnickly commnnicated its deadly flames to the buildings adjacent thereto. For a while it seemed as thongh the entire property wonld be annihilated by the conflagration. Only the mill was saved of the surface bnildings. Even the shaft was mntilated for hundreds of feet. This was a misfortnne which the owners of the Maryland could illy afford to bear. They had only been in possession of the property a few months and had paid abont $70,000 of the purchase price when this calamity befell them. They had secnred the property after long and costly litigation, and for a time there were doubts as to their ability to rebnild. Previons to this time the Maryland, then known as the Idaho, had worked uninterruptedly for twenty-eight years. In that time $12,000,000 had been prodneed. Employment was given to 200 men, the mine was producing exceedingly well and fortune seemed to smile on the fortunate owners. The throwing out of employment of such a large number of men was an affliction which Grass Valley could not lightly bear. She was suddenly deprived of a revenne amounting to $750 a day, and the depressing effect was evident.

"Misfortunes never come singly" is an old adage, as true, probably truer, in mining as in other professions. Almost simultaneous with the Maryland disaster came the closing of the Champion mine of Nevada City. An injunction was placed upon the Champion Company by the Wyoming Company, and operations were entirely suspended. The latter company contended that the former was encroaching on its ground and they were determined to settle the difficnlty by judicial proceedings. The closing of this mine greatly affected the activity and prosperity of Nevada City. The Champion was one of the largest and most prodnctive mines in the county, a regular dividend payer and employed 150 men. It had been reopened and worked under great difficulties, causing the ontlay of an immense snm of money to put it on a paying basis. The company was just begiuning to realize the benefits which always accrue from capital judiciously invested, and the town was just emerging from the siege of depression which had hovered aronnd since the snppression of hydraulic mining, when this clash came. But the law is uncompromising, and this mine was destined to remain idle several months, much to the detriment of business and the prosperity of the town.

With the beginning of March a decline in the production of the North Star mine was strongly perceptible. This mine had increased its outpnt the previous year, as already stated, by over $100,000. A "crossing" was encountered in the 1800-foot level, the appearance of which nonplussed the owners and several mining experts who examined its peculiarities. As depth was attained, the "crossing" continued and became more formidable in size and the character of the rock which composed it. It was evident that nnless the "crossing" changed its course, and took a more westerly dip, it would seriously affect the ledge and limit the product of the mine. These fears were realized, and by the end of the month a reduction in the force of men, which was then 200, was made. This added denseness to the gloom overhanging the city from the suspension of the Maryland mine. The company continued to reduce its working force nntil in September nearly all of the 200 miners employed were discharged. Only a few prospectors were retained to try and unearth some new snbterranean riches. The company, evidently discouraged through the loss of the rich deposit of ore which had paid so magnificently, decided to abandon the mine entirely; bnt they shortly after reconsidered the matter of closing the mine, and there are now about one hundred tribnters at work there. It is to be hoped that they will snceeed in discovering a new "lead" which will retrieve the prestige of this famons mine and make it as prosperous as in days of yore.

In August the Centennial mine, which had been reopened by a company composed chiefly of Sacramento business men, superintended by A. W. Stoddart, suspended operations. This incident was only serious in so far as it apparently blighted the prospects of one of the most promising mines in Grass Valley. There were only a few men employed by this company, and they were working under the contract system. The men who were most deeply interested in the property claimed that they were nnable to meet the obligations of the mine, having to depend on their current business for financial snpport; bnt the great railroad strike so seriously affected their business that they were compelled to abandon the property. The Centennial is destined to become a valuable and permanent property. The writer personally inspected it, and in his correspondence to this journal at the time stated: "The Centennial Company may be congratulated on the possession of a very promising property; and if they are wise in their day and generation, they will spare no expense to make the development of the mine rapid and complete." This statement still holds good, as little development work has been done since that time. This mine will not be permitted to remain idle long. It is by far too valnable a property to remain in a state of desuetude. From 1876 to 1882 a party of common prospectors extracted over $500,000 from the vein, which averages a foot in thickuess. The last ton of ore crushed before the mine was purchased by the Sacramento syndicate paid $35.

Up to this time we have ouly written of the reverses experienced by the mining industry in this county. I have faithfully portrayed the dark side of the picture, and the most unpleasant part of the task is over; but as every cloud, however black, is supposed to have a "silver lining," so there is a bright side to the mining elements here. There were occasious when the snn of prosperity aud encouragement wonld shed its effulgent rays and illumine the gloom. While we did not realize all that we anticipated, and while the Allison Ranch, Massachusetts Hill and Rocky Bar Hill mines were uot rehabilitated as we were led to expect they would be, still there were other developments which gave canse for encouragement and enthusiasm.

The most marked improvement of auy environment of the county occurred at the Osborn Hill. This famous hill will eventually become one of the richest sections of Nevada county. The mines that have been reopened on this hill have paid immensely on the capital invested. The attention of capitalists is being constantly directed to this section. In the early days this hill was a bee-hive of industry, and now that its intrinsic value has become known we may anticipate remarkable improvements. The Osborn Hill is notably the most successful of the old mines which have been resuscitated. At a depth of 450 feet it produced $2,000,000, yet it is richer to-day than it ever was. It is one of the most productive mines in Grass Valley and employs a large number of men. During the past year the company has erected a new mill, increased the dimensions of its hoistiug works and the capacity of the machinery therein contained. It now gives every indication of being a valnable and permanent property.

The Electric mine, too, is situated on this hill close to the Osborn Hill mine. Many important developments have occurred there during the past twelve months, and the present prospects are very flattering. A mill has been erected and substantial hoisting machiuery constructed. The last ore extracted paid $50 per ton—a very rich vein considering the cheap facilities for milliug. On the same hill is the Conlin mine, which is rapidly making strides on the highway to prosperity. Much is expected of this property when it is properly developed. The Daisy Hill mine is situated in close proximity to the above mentioned mines. It promises to be a remnnerative property from the start. It has been reopened during the past year and worked in a manner which reflects great credit on the owners. A vein of ore twenty-one iuches thick and averaging from $30 to $50 per ton has been nncovered. A substantial hoisting and pumping plant has been erected, and the mine is lighted by electricity throughout.

The Merrimac has also been reopened during the past few months under the superintendency of L. P. Goldstone. Much may be expected from this source, as the mine has produced some rich ore during former workings. The South Idaho mine has made considerable progress in the past year. The last crushing of ore extracted averaged $200 a load.

In Nevada City the progress has been no less marked and eqnally gratifyiug. Several abandoned properties have been rehabilitated and give evidence of becoming valuable and permanent. The feature of greatest significance to the community is the purchase of the Wyoming mine by the Champion Company. This disposes of the dispnte involved in the suit brought by the Wyoming Company to restrain the Champion Company from trespassing on their property. This consnmmation is fortunate for the bnsiness interests of the town because the Champion Company purchases all its materials from local business honses. These properties will be developed ou a large scale in the coming spring. Other mines have been reopened, notably the Contact, Col. R. Clark, Home aud Reward. Some of these mines have produced remarkably well in former years, and they are being finely equipped with modern appliances, which indicates a long lease of life so far as good intentions are concerned. Most of them are under careful and experieuced management and will undoubtedly become valuable acquisitions to the town. The gravel mines have made a very favorable showing during the past year, especially the East Harmony and West Harmony, and they are expected to maintain their equilibrium during 1895.

And now I wish to refer to the prospects of the mining industry in Nevada county, as viewed from its present condition. We enter the year 1895 with a feeling of confidence. It is true that the production of our mines for 1894 will be less thau for the year previous. The reasons for this falling off have already been given. Most of the causes which led to the reduction were nnavoidable, such as the closing of the Champion mine, the Maryland disaster and the "crossing" encountered at the North Star. These events occurred without having "cast their shadows before." Some of the mines newly opened have compensated in a certain measure for the loss sustained through the suspension of some of the older mines. But it will take a number of small mines to equal the productiou of the North Star alone, which in 1893 produced in round numbers $335,756.

We confess we have bnt little faith in the immediate resumption of hydranlic mining. The immense benefits which would accrue to this county through the complete resuscitation of this system of mining can ouly be estimated by those who witnessed the perennial prosperity during the halcyon days of hydraulicking. We believe that American skill and genius will devise some means, in spite of the persistent opposition of the valley, whereby hydraulic miniug may be resumed without injury or detriment to farming interests. We believe that the miners

will ultimately triumph. Bnt the legal obstacles are so great and numerous at the present time that we do not anticipate mueh increase from that source, although several mines have heen given permits to resume operations. We must still rely on our quartz mines for the maintenance of our position as the leading gold producing region of the State.

It is my intention to point out—so far as my knowledge of the mines of this county permits me, and without going into detail as to my reason for so doing—where we are likely to derive an increase in our revenue. In Grass Valley the older mines are all in good condition and producing steadily. It is conservative to assert that some of them are "looking" exceedingly well—better, probahly, than they have appeared for several months past. This is especially true of the Maryland, Omaha Con., Empire, W. Y. O. D., New Orleans and Pennsylvania mines, which we regard as the oldest and most substantial in this district. Marked improvements have heen noticed in all these miues within the past few weeks, and an increased output may be anticipated in the near fntnre. The Peunsylvauia Company is just heginning to reap the reward of patieut and persistent prospecting. They have managed to keep their heads ahove water for the past six years and now they are heginning to swim. From the Osborn Hill environment we expect splendid developments dnring the coming year. Up to this time the Oshorn Hill mine has, in a great measure, heen doing preparatory work. They are now ready to work the mine on a large scale and we predict a great increase in the production of this mine. The same must be said for the other mines situated on this hill. The Electric, Daisy Hill and Conlin mines are in a position where they can he relied on to add materially to the gold producing capacity of Grass Valley. Then there is the Rose Hill mine, which has been honded by a company of Kansas capitalists. This mine has produced over $100,000 at a very superficial depth. The gentlemen who have possession of the property are capitalists of meaus and they are so highly pleased with the prospects that they have announeed their intention of developing it on an extensive plan.

The Kate Hayes mine is situated on the hill whose name it bears. In the '60s it was a noted mine, although uot worked to auy great depth. It is in a locality which guarantees the development of a splendid mine. If the mine is properly worked—aud we have reason to think it is under eapable management—it will prove a divideud-payer hefore the expiration of 1895. The South Idaho is another of the mines that is full of promise. The proprietors, who are mostly local men of limited means, are pegging away in the hope that they will eventually develop a large and productive mine. These mines, which are nearly all new, in company with the Merrimac, Slate Ledge, Wisconsin and several others, are expeeted to show a large increase in their production during the coming year.

Rumors are afloat to the effeet that James D. Hague has signified his intention to work the mines recently purehased by him on the Massachusetts and Rocky Bar hills in the spring. It is impossible to conceive the object of sueh derelietion on the part of the owners of these mines, considering the rich mineral belt in whieh they are loeated. The only reason to be assigned is that the company represented by Mr. Hague is waiting until cheaper motor power is iutrodueed—for it is impossible to convey water to these mines for motor power—which is a very important feature in developing mines on an extensive scale. If the proprietors of the Allison Raneh are sineere in their statements, that mine will also be reopened in the spring. We eannot grasp the possibilities of this mine when it is properly developed. It has not heen operated for over thirty years, bnt when it was worked it produeed $3,000,000 at a depth of 200 feet. The resuseitation of the Allisou Raneh would give a new lease of life to the village whose name it is known by. It is also stated that the famous Gold Hill mine is to be reopened in the spring, which is very gratifying news to all Nevada countyans.

In Nevada City the largest increase is expeeted from the Champion-Wyoming mine. No more enterprising company than the Champion ever operated in this eounty. They enter into all their transactions with a vim aud energy deserving of suecess. They have unlimited means and a rich property. Their future plans have uot yet been diselosed, but it is gratifying to know that this important mine will not suffer in the coming year in the same manner as it has done this year through litigation. It will undoubtedly treble its output in 1895. It is now recognized as one of the bulwarks of the mining industry here. The purehase of the Wyoming property refleets great eredit on the Champion Company and exhibits a strong business sagaeity. It is cause for eongratulation in Nevada City, because hoth the mines will be developed jointly and under the same management.

The Mountaineer mine is steadily progressing without the hlare of trumpets. W. A. Deunis, the superintendent of this mine, is one of the most competent and reliahle mining engineers that ever entered Nevada county, which meaus much. At the Mountaineer he has brought order out of chaos. He labored assiduously until he brought the mine into a high state of efficiency; from an almost worthless property into a dividend-paying mine. During the past year he found it necessary to reduce his working force for the purpose of prospecting certain parts of the mine which had been previously neglected. He has succeeded in developing these abandoned sections, and the old force of men is at work again. We may expect an increase of production from this source in the eoming year.

The Providence and Nevada City mines, both large producers, still maintain their position among the leading mines of this town. Barring unforeseen events, these mines are likely to greatly increase their product during the coming year. Especially is this trne of the Nevada City mine. The purchase of the Mayflower mine by a company of capitalists represented hy Mr. Lane of Calaveras is considered a fortuuate ineideut here. This mine was owned by the Martin brothers of this city for a number of years, and was operated by them on a very meager scale. The transfer of the property indicates that it will he developed on a scale commensurate with its worth. The company is a wealthy one, aud, as soon as the weather permits, will make exteusive improvements on the mine. This will help to swell the increase in production everywhere prevalent. The new mines that have recently started will add materially to the wealth of the couuty. We cannot look to them for much of an increase in the near future, hut hefore the expiration of 1895, with proper preparatory work, they will become suhstantial properties. Quartz mining has received quite an impetus on the San Juan Ridge during the past year. In close proximity to the town of San Juan are some very promising prospects. They are located on the Boss ledge, which is said to be a veritable honanza. This vein is an immense deposit of gold quartz. Its correct width has not yet been ascertained, althongh it has been developed for eighty feet. A eompany of San Franeisco capitalists have recently organized to work a portion of this ledge. Should they prove successful, and we sineerely think they will, an interest in that section of the eounty will have been aroused that will result in material benefit to San Juan and the county as a whole. The Live Oak and Badger Hill mines are also situated on this ridge aud give evidence of becoming reliahle bullion producers. If development work in the quartz mines on the San Juan Ridge continues during the coming year, and suffieient capital ean be interested in their welfare, they will prove a valuable adjunct to the eounty.

I have eudeavored to faithfully diagnose the present condition of the mining industry of our eounty. I have made no attempt at exaggeration or to lend eolor to any of the statements I have made. Every assertion can be substantiated by a personal investigation of the properties ahove mentioned. I have suffered too much myself from ephemeral hooms, whieh have been concocted in the minds of reckless speculators, to delude miners and capitalists, to try and mislead others. Parties interested in Nevada county mines have always pursued a eonservative eourse, sometimes to the injury and detriment of their own interests. But from present indieations it is safe to assert that this eouuty is just enteriug on an era of genuine prosperity sueh as it has not been her good fortune to enjoy since the suppression of hydraulic mining.

Nevada City, Dec. 24, 1894.

Right Kind of "Salt."

Surprise and amusemeut were created among the offieers of the Mereur Mining Company yesterday by the report of Attorney Frew's testimony as to the "salting" of the mines reeently purchased by them in California. The gentlemen were inelined to admit that the best of experts ean be fooled by "salting," but they are at a loss to understand how it is that, if the mine really was doetored, the ore they have taken out sinee the purehase of the property has run higher in assays than that ou the basis of which they bought the mine. Two carload lots were taken out under Mr. Brown's direetion previous to the purchase aud earefully run through the mill under his supervisiou. Then, immediately after the purchase, Mr. Browu went to the mine again and took ont another earload lot to be brought to this eity for a test in connection with two kinds of mills, in order to determine whieh one eould be used to best advantage. All that ore was removed from the mine, as it were, directly uuder Mr. Brown's nose; yet it ran several points higher than the first two lots.

Messrs. Dern, Airis, Brown and others, therefore, are not made at all uneasy hy Mr. Frew's deelarations. They believe that the property has been tested, and that they have become owners of something of real value. Only a break in the weather is awaited before steps will be taken looking to the ereetion of milling and other improvements.—Salt Lake Trihuue.

M. WOLFF has a five-eolumn article in a contemporary arguing that the earth is uot an oblate spheroid iu form. He says its shape is that of an elongated cone, and proves it—to his own satisfaction. The gentleman who recently destroyed the gravitation theory need no longer be lonesome.

Tuolumne County.

From Our Traveling Correspondent.

TO THE EDITOR:—Just below the junction of the North and Middle Forks of the Stanislaus river J. S. Suhlett of Murphys, Calaveras Co., is opening up a quartz mine with a ground sluice. His mine, the Chimey Rock, is abont half way up the steep mountain side. Here a stroug reef of granite crops and forms the hanging wall of his vein. This wall shows a skin of quartz rich in gold. The vein and footwall have been gronnd down by a slide a width of twenty feet. This matter Mr. Sublett is slnicing out to get at his vein. It is rich in gold, and in it are found pieces of the ledge two to four feet wide, all rich in visihle gold.

Adjoining this vein are several ledges that show very good rock and on which consideralle work has been done, but it is the Chimey Rock vein that he looks upon as his honanza. South of this lie the Col. Dorsey mines. Mr. Dorsey's working partner, Elliott, has bouded his interests, and it looks as though something might now be done with this group of mines. To the east the Star and a number of other mines have recently been honded by Eastern people, who are at work developing the same.

The Keltz, W. Sharwood of Soulshyville superintendent: The mine is steadily being developed by extending the drifts in from the mountain side. As the drifts get depth the quality and quantity of the rock increase in value and size, and the mine is in a more prosperous condition to-day than at any time past, with a hright future before it. The mill is now of fifteen stamps that are kept continuously dropping on the quartz from the six-foot ledge.

West of the Keltz and east of Columhia is the Ham and Birney, W. Sharwood superintendent. The vein's eourse is from hottom to top of a ridge 2000 feet high. The miue is developed by a series of drifts driven from the surface on the vein. The vein is ahout five feet in width and is in slate walls. The veiu is very flat and the baek seams immense. The vein ean be developed from base to snmmit by drifts to a depth of ahout 2000 feet, and as no sinking, pumping, hoisting or expensive timbering are required, the ore ean easily he mined and milled for not to exceed $2.50 a ton. There is a new ten-stamp mill that was started to dropping while I was at the mine. This mill is situated about half way down the mouutain side, and, while this mill has a high head of water, its waste water ean he used to run another mill at the base of the hill. The mill is of Mr. Sharwood's designiug, and in it are a number of features that will reeommend themselves to millmen. The front plate in the battery slopes up to and against the screen, with no strips on the inside of the screen. This eauses the water to flow up and against the screen iu an even, continuous play, aud thus add to the discharge. Just above the sereeu is a narrow board, which, when removed, enables the millman to see the condition of the battery and to fish out any floating wood. Above this is a sheet of iron with wooden frame. The whole front of the battery can be removed hy simply turuing a few huttons. In front of the screen is a narrow plate. Below this the ore flows into a narrow hox, and from it through pipe to the plates. These pipes are about two feet long, thus leaving a space for the millman when cleaning up. The plates are hung on rods at the lower ends, so that they can be given any desired piteh. The situation, water power, size and value of the vein make the mine a good proposition.

Old Tnolumne, R. C. Davis of Colnmbia, snperintendeut: The mine is northeast of Columbia, on the south fork of the Stanislaus river. The drifts are now in 800 feet on the old and 1700 feet on the new, and they are still driving for the vein. In the old drift the vein is about four feet of $10 ore. Five stamps are now droppiug and five more will soon he started. The mine is an old property, but had been idle for some time. With the exeeption of one or two small claims there is now uothiug doing in gravel in this ouce famous section from Columhia to Sonora.

Summersville.—Eureka Con., better known as the Old Dead Horse, is running steadily, with Mr. C. H. Thomas as superintendent. The shaft is now down 1360 feet, which makes it the dcepest mine in the eounty. The vein runs from four to five feet in width. At this depth Mr. Thomas mines and mills for an average of $2.50 a tou by the year, and has done it for $2.25, which is very elose for shaft work. The mill is of twenty stamps and the whole plant is operated by water power. Just south of the Eureka John Rhuhe has taken hold of the Lady Washington, and with his usual luck, or rather knowledge, has shown up a shoot of good ore. The Seminole is also said to be looking well, but as the operators of these two were not on the mines at the time of my visit, I eould not get any reliable information eoncerning either.

Northeast of Summersville is the Cherokee distriet. Ou the north extension of the Dead Horse is the Laura, W. Long, superintendeut. The company has put dowu a shaft 400 feet and drifted 850 feet north on the four to five-foot vein. The superintcudent is running to catch the junction of the Car-

lotta and Pennsylvania with their vein. As both these veins are known to be rich, he has every reason to expect a rich shoot at their junction. About 1100 feet north is the old shaft, the ore from which prospects well. Mr. Long has averaged 100 feet a month in sinking and drifting in granite with a force of but six men. This mine is in the Cherokee district. Mr. Leachman has had the Carlotta and Pennsylvania pumped out for inspection. The Carlotta shows fifteen inches of $35 to $45 ore, while the Pennsylvania, adjoining, shows two feet and over of $10 ore. The mines are the property of Mr. Fred Sutton of Sonora, and are as good an investment as can be found in the country. Mr. Sharwood of Soulsbyville owns the Ponto Fino, which is just south of the Carlotta. This is a small vein of heavily mineralized ore, a property that would delight a Colorado operator who knows what can be done with small veins of good ore. If these three mines were consolidated they could furnish sufficient sulphurets for their own chlorination plant, and thus by working the ore on the ground could be made a very valuable property.

Soulsbyville.—The Old Soulsby, W. Sharwood, owner: The shaft was put down 800 feet and a drift run south, and above this three million dollars was stoped out. When this was exhausted, a drift was run north; and as no ore shoot was encountered, the mine was shut down. South is an old shaft, in which, at eighty feet, the early miners came to a "throw" in the vein and stopped. The vein matter here went $100 a ton. Pieces of ore found in the old dump show visible gold very freely and prove the value of this ore shoot. It is only necessary to continue this shaft on down and crosscut to get the same shoot; and when sufficient depth is attained to drift north under the old works, and get the north shoot, there is a large area of virgin ground, and the Old Soulsby only needs to be reopened to be added to the list of the big mines of the State.

The Oaks Con., C. E. Shafer, superintendent: This is the old Black Oak mine. The present owners have reconstructed the hoist and mill, and everything indicates that the mine will now begin a chase to show what there is in it. The superintendent is putting down the shaft on a nine-foot vein, carrying four per cent of high-grade sulphurets in addition to the free gold. The ten-stamp mill is kept dropping on the ore taken out in sinking above. Everything goes to show that this mine is all that the writer, in the past, has claimed for it.

North of this section on Sullivan creek is the Bellview or Hyde mine, A. M. Mackdonald superintendent. The mill of ten stamps is idle, while the shaft is being put down 200 feet by contract.

Sonora.—This is a very pleasant place for a residence; and being centrally located, makes miniug in this county all that could be desired. The volume of business in Sonora is not as great as would be expected from the extent of mining and agriculture. This is due to the fact that all the old camps, which are scattered all over the county, have large stores that do a thriving business. At Sonora the Golden Gate is still in the hands of the affable receiver, Mr. R. B. Lane, pending litigation. The shaft is now dowu 660 feet, with levels run 800 feet north and 500 feet south. The veins' value is almost entirely in the sulphurets, which are high in grade. The mine is equipped with ten stamps and chlorination works, all run by water power. The Old Bouanza mine has "gone out of bonanza," and is resting on its laurels, while the lucky superinteudent, D. R. Oliver, is hunting for a big pocket in the Oregon mines. The pocket miners are at work throughout the county, but of late have struck no big pockets.

Jacksonville.—Mammoth mine, J. F. Bluett superintendent: This property, 2200 feet in length by 300 in width, is now the property of the Mammoth Mining Co., owners of the Sierra Buttes mines. The mine is situated on the east bank of Woods creek, just north of its junction with the Tuolumne river. The veiu is the mother lode, which is being developed by three crosscut tunnels, the lowest of which will tap the vein 500 feet deep. In one of the tuunels the vein is being crosscut, and is now twenty feet wide and the wall not reached. The ore shows visible gold, and the owners are feeling very good over their purchase. A mill site for twenty stamps is now being graded. Additional stamps will be added as the mine is developed. The mine has its own water system, and the future looks very promising for this English company, which, under Mr. Wm. John's management, have steered clear of the breakers that so many of these English companies wreck on, and in their Plumas-Eureka, Sierra Buttes, Uncle Sam and now Mammoth have some of the best mines in the State.

Just north of the Mammoth, on the Eagle is to be found one of the strongest croppings on the mother lode in California. It is remarkable in its height, width and extent.

Quartz Mountain.—On the App the shaft is down 825 feet, with drifts run 225 feet uorth and 250 feet south. The drifts are now being extended.

The Miller & Holmes, E. A. Stent, superintendent: The south shaft is down 250 feet, with drifts run north and south, and crosscuts 140 feet west and 108 feet east. While I was at Quartz Mountain the superintendent received notice that the miue had been taken by the Napa Quicksilver Co.

The Golden Rule, O. S. Cressy and W. McGinn, proprietors: The shaft is now down 200 feet and will be put down to 250 feet, when they expect to strike an old shoot that milled about $10 a ton from a ten-foot vein. The mine has a ten-stamp mill.

The Juniper, Hunt & Landers, proprietors: This property has just been takeu hold of. The owners are taking the water out of the old 140-foot shaft. The ore from this shaft is said to have milled $14 a ton, in addition to the pockets.

The Dutch, A. Trittenbach, superintendeut: The drift is now being run north from the third level and is in about sixty feet on the hanging wall of the east vein. This drift will cut a known shoot to the north in about forty feet more. In the shaft the vein is about five feet wide of ore that samples from $21 to $42 a ton. The Dutch has all the veins of the mother lode and are but a few feet apart on the surface. In addition, there are a number of feeders, good, big ledges in themselves, coming in on both sides that have been so rich that they were worked as pocket veins. It is only a question of development with this mine, and once Mr. Trittenbach gets his property equipped and developed as he has planned, the Dutch will be the peer of auy other nationality, for "it has the stuff in it." All of the mines here mentioned are on the mother lode.

The Pine Ridge, Stent & McDougal, proprietors: This mine is about one mile west of the mother lode and runs east and west, making it a spur or feeder of the mother lode. The vein is from two to five feet wide, with a porphyry hanging wall and slate foot wall. The shaft is now down eighty feet. All the ore taken from the shaft has been milled, giving $14 to $23 a ton.

Jamestown.—The Gem mine, Henslee Bros., proprietors: This property is better known as the Harris mine. It is being worked by an open cut which, with water power, enables the owners to mine and mill with their ten stamps for $1.25 a ton, the $5.50 to $7.50 ore of the vein.

The Crystalline: This property is being developed under bond by the Black Oak Co. They have a crosscut in and drifts run on the lode.

Leaving the Crystalline, you drive north over the mother lode to the summit of a hill, where, looking down, the Rawhide miue with its numerous red buildings spreads out like a pauorama below you and suggests a military post or State institution iu the exteut, uuiformity of color, design and general neatness of the entire plant. The mill I have deseribed before; suffice it to say that it is a model in every detail and is a credit to the millwright who designed and constructed it. Since my last visit a chlorination plant of three tons a day capacity has been erected. This, too, is a model in every way, particularly iu its trim, well kept appearance. The hoist is in keeping with the rest of the plant, while the large boarding house with its porches filled with geraniums in bloom suggests more a summer resort than the customary barren mining plant. The affable superintendent, Mr. Nevills, informs me that the shaft is being sunk to the 600-foot level, while drifts have been ruu 250 feet north and south. The east vein averages ten feet iu width, while on the west a forty-five foot crosscut has not reached the walls. This mine has the reputation of producing the richest ore of any mine in the State; but, like other owners of good mines, Mr. Nevills regrets that it is uot policy to say anything about the ore values; and so while mining assessments, failures and frauds are glariugly advertised the good mines of the State are forced to keep their product to themselves, and in consequence the capitalists on the outside assert that more mouey has gone into than has ever come out of the mines, judging from what they see printed.

The Rawhide No. 2: This miue is the property of Mr. A. Hayward and adjoins the Rawhide on the south. Mr. W. Garrard, of the Gold Cliff mine at Angels, has recently put down a shaft on the north end of this mine and quietly remarks that "She only wants a shaft 600 feet to make her the equal of the Rawhide."

The Rappahannock, R. Chute, superintendent: This mine adjoins the Rawhide on the north. It is equipped with a good steam hoist and the shaft is now down 125 feet in the footwall. The vein in the air shaft prospects very satisfactorily and makes Mr. Chute confideut that he has but to get there to get it. Several mines to the north have recently been bonded and work will soon be commenced.

The Darrow mine, Darrow Bros. and Whitney, proprietors: This mine is about three-fourths of a mile northeast of the Rawhide aud about 1200 feet east of the Rawhide vein. The mine has been worked off and ou for the past thirty years and was once incorporated for $1,500,000. During the past year $19,000 was taken out by the expenditure of about $300. The vein is a mixture of slate and quartz about ten feet wide, and carries three per cent of sulphurets that assay $100 a ton. The owners put the average milling value of the vein at $10 a ton. They have now erected a water-power hoist aud will proceed to develop the mine. Iu clearing out the old shaft it became necessary to put a shaft into the footwall. This shaft threw out quartz which is "just lousy with gold."

Tuttletown.—The old Pat Mullen mine, just southwest of Tuttletown, has been secured by Mr. E. C. Loftus of the Golden Gate mine. He is engaged in driving a tunnel from Mormon creek aud shows very haudsome rock; it is good for a fine property.

Frank Grass and Williams are also starting a tunnel on their mine on the west branch of the mother lode.

The writer has endeavored several times to secure a map showing the situation of the various mines, the different mineral belts and the geology of the county, but has failed. In the higher elevations are the Sugar Pine mines. These were worked extensively years ago and were very rich. Below them follows the belt in the Dead Horse group. Adjoining come the cross veins in the Cherokee belt; then the Soulsbyville granite belt, while to the north are the Keltz, Ham & Birney, and other mines in the slate. Still on west is the Sonora belt, with the Golden Gate mine. To the south and north, extending to Columbia, is the pocket belt in the dykes and slates adjoining the limestone belt. Lower down and west the mother lode enters the county from Mariposa county at Jacksonville, and follows across to Quartz Mountain, Jamestown, Rawhide, Tuttletown, and crosses into Calaveras county at Robinson's Ferry. In the vicinity of Tuttletown are numerous pocket veins on Jackass Hill that have in the aggregate yielded large amounts. In pocket mining Tuolumne has stood at the head, with a production of $3,000,000 from the Bonanza in pockets. West of the mother lode are several strong ledges, while numerous feeders cross the country through this talc and serpeutine slate belt. As will be seen, the county is traversed by succeeding mineralized belts that extend from the plains to the higher altitudes in the mountains, giving it an extent of mineralized country not equalled by any county in the State, thus assuring the mining future of the county.

The mines in operation aud those in course of development will soon need an increased water system, and the present ditch owners should awaken from their Rip Vau Wiukle sleep to the condition of the present and prospects for the near future. There is nowhere a safer, more profitable or desirable investment than the purchase and iucrease of this water system. As you leave Tuolumne the last stopping place is the Chicken House at Tuttletown, where all mining men find an excuse for stopping. No matter how bad the weather, unfavorable the ventures or churlish the treatment received elsewhere, oue meal of the delicious fried chicken served here blots out all else and the traveler journeys on, singing "Here's to Old Tuolumne, and may her gold output and chicken crop never grow less." E. H. SCHAEFFLE.

Murphys, Cal., Dec. 19, 1894.

Quicksilver.

California has the only important quicksilver mines on the American eoutinent, but this industry in late years has had to contend with a number of uufavorable factors. The unprecedented decline in the value of silver bullion, and the consequent restriction of mining operations, greatly curtailed the demand; and the loss of the Chiua trade, for many years the chief support of the quicksilver market, was also a serious setback to oue of California's most important industries.

When a large number of deposits were being worked iu this State, aud the output resulted in low prices, California successfully outbid Loudon for the trade with the Orieut. But as the price of quicksilver declined to a point at which mauy of the small mines could not be profitably worked, the list was narrowed down and the annual yield fell off considerably. With a more limited yield, however, and such demands as were made on producers from New York, etc., the market recovered to some extent.

The average price in 1880 was $31 per flask, declining to $27.25 in 1883, and advancing to $53.25 in 1890. The present current rate is $37.

The largest annual production was 79,396 flasks, in 1877, and the largest number exported by sea and overland was in 1879, being 62,845. The highest price on record iu the San Fraucisco markets was $1.55 per pound, in 1874–5, and the lowest was 33 cents in 1879.

In November, 1874, a contract was made for the monthly delivery of 400 flasks for one year to the Bonauza mines at $1.50 per pound.

There was an increase in the export trade during the year. There were 3346 more flasks exported in '94 than in '93, but the value in '94 was but $541,380 as against $581,616 in '93, the prices haviug been lower last year.

The exports of the year were distributed as follows:

To—	Flasks.	Value.
New York	8,120	$243,600
China	4,600	138,000
Australia	100	3,000
New Zealand	10	300
Central America	804	24,120
Mexico	4,161	124,830
British Columbia	46	1,380
Canada	200	6,000
Japan	5	150
Totals	18,046	$541,380

A recapitulation of the shipments by both sea aud rail duriug the year is as follows:

	Flasks.	Value.
By sea	18,046	$541,380
By rail	10,933	395,400
Totals	28,979	$936,780

Scientific Progress.

A Chemical Curiosity.

Among the various uses to which electricity has been put since its cheap production by the modern "dynamo" has been secured is the reduction of metallic ores or compounds in one or another form of the "electric furnace." The production of aluminum on a large commercial scale is the oldest and best known of these. There are, however, several cases in which the separation of the single element is not secured even in the electric furnace, but in which the element desired, while parting with its former companions, insists upon a substitute, and takes the same from the carbon electrodes or lining of the furnace, or from carbon mixed with it. This is the case in the manufacture of "carborundum," which is a compound of silicon and carbon, formed by heating silica and carbon powder in an electric furnace. This compound has reached a large commercial application, by reason of its extreme hardness, which makes it a very superior substitute for emery or corundum, as a cutting and polishing material. The latest development in this direction, however, is seen in the calcium carbide, which is prepared by heating in an electric furnace a mixture of lime and coal dust. The metallic calcium liberated by the action goes at once into combination with carbon to form a carbide, which is a mineral body of remarkable properties.

In appearance, when in masses, it somewhat resembles the mineral serpentine, being of a greenish-gray color and crystalline fracture, with a luster like feldspar. If a few drops of water are thrown on this mass of seeming rock, gas is given off, which, if ignited, burns with a brilliant flame; and, by continuing from time to time to sprinkle the rock with water, it will be made to blaze continuously as though it was being sprinkled with some very volatile and inflammable oil. If a fragment of the mineral is thrown into a glass of water, a rapid evolution of gas results, which may be ignited, and will continue to burn until the mineral is exhausted. The cause of these actions is that the calcium carbide in contact with water forms calcium oxide and acetylene gas, the oxygen of the water combining with the calcium to form calcic oxide or lime, and the hydrogen of the water combining with the carbon to form acetylene. It is proposed to use this calcium carbide for local gas machines. A charge of the mineral is placed in a closed vessel into which a regulated supply of water is admitted. A little water entering forms a quantity of gas whose pressure shuts off the water; but, as the gas is used up, more water comes in to renew the supply. What may be the commercial value of this material cannot be at present determined, but it is certainly a great chemical curiosity.

Four Hundred Degrees Below Zero.

Four hundred and twenty-four degrees Fahrenheit below zero! Just what this means it is almost impossible to imagine, and yet it is one of the temperatures which have been reached and used in laboratory research, and has been made the subject of some highly interesting experiments and explanations by Prof. Dewar, before the British Royal Institution. Four hundred degrees below zero is not an everyday temperature, nor can it be reached by more every-day means than the expansion of liquid air, which latter Prof. Dewar has succeeded in producing in comparatively large quantities, and in storing by novel and ingenious methods, to be used as required in the study of matter at abnormally low temperature, exactly as a spirit lamp or a Bunsen burner is used in studying the properties of different bodies at the higher temperatures.

The tensile strength of iron at 400 degrees below zero is just twice what it is at 60 degrees above. It will take a strain of sixty instead of thirty tons to the square inch, and equally curious results have come out as to the elongation of metals under these conditions. It was an idea of Faraday that the magnetism in a permanent magnet would be increased at very low temperatures, and experiments with comparatively low temperatures had rather negatived Faraday's suggestion, but Prof. Dewar has completely verified the opinion of the famous savant, having shown that a magnet at the extremely low temperature made possible by the liquid air had its power increased by about 50 per cent. Very low temperature was shown also to have a remarkable effect upon the color of many bodies. For example, the brilliant scarlet of vermilion and mercuric iodide is reduced, under its influence to a pale orange, the original color returning with the rise of the temperature. Blues, on the other hand, are unaffected by cold, and the effect is comparatively small upon organic coloring in matters of all tints.—Cassier's Magazine.

The New Constituent of the Air.

Lord Rayleigh's curious discovery is that the gas obtained by taking vapor of water, carbonic acid, and oxygen from common air is denser by $\frac{1}{230}$ than nitrogen obtained by chemical processes from nitric oxide, or from nitrous oxide, or ammonium nitrite, thereby rendering it probable that atmospheric air is a mixture of nitrogen and a small proportion of some unknown and heavier gas. Rayleigh and Ramsey (who joined in the work at this stage) have since succeeded in isolating the new gas, both by removing nitrogen from common air by Cavendish's old process of passing electric sparks through it, and taking away the nitrous compounds thus produced by alkaline liquor; and by absorption by metallic magnesium. From this occurrence Lord Kelvin deduces "a fresh and most interesting verification of a statement which I took occasion to make in my presidential address to the British Association in 1871: 'Accurate and minute measurement seems to the non-scientific imagination a less lofty and dignified work than looking for something new. But nearly all the grandest discoveries of science have been but the rewards of accurate measurement and patient, long-continued labor in the minute sifting of numerical results.' The investigation of the new gas is now being carried on vigorously, and has already led to the wonderful conclusion that the gas does not combine with any other chemical substance which has hitherto been presented to it."

A Big Copper Deal Predicted.

Chicago advices say: An international deal in copper is likely to be perfected soon. Ever since the smash-up of the great corner in copper which was created by a French and English syndicate three years ago speculators have been figuring how to put through some such scheme. This time it is a combination of French capital which will engineer the scheme. Representatives of the combine were in Chicago several days ago and were joined here by John Dempter of Glasgow. Arthur Turnbull of New York, who is interested in the American end of the deal, also came on here, and yesterday this party left for the West. Their mission, it is said, is to confer with the owners of the immense Montana and Arizona properties.

The scheme of the syndicate is to get the owners to cut in two the output and not exceed 5,000,000 pounds a month. This would bring down the figures of the Anaconda properties to those of the Hecla and Calumet mines. All the arrangements have been made for the carrying out of the deal, and it only remains for Marcus Daly to give his consent. He is a difficult man to deal with, but the promoters profess to believe that they can afford to offer a big inducement.

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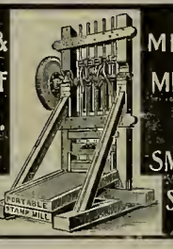

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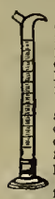

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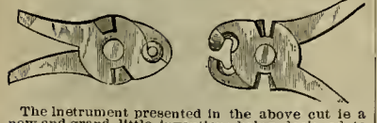

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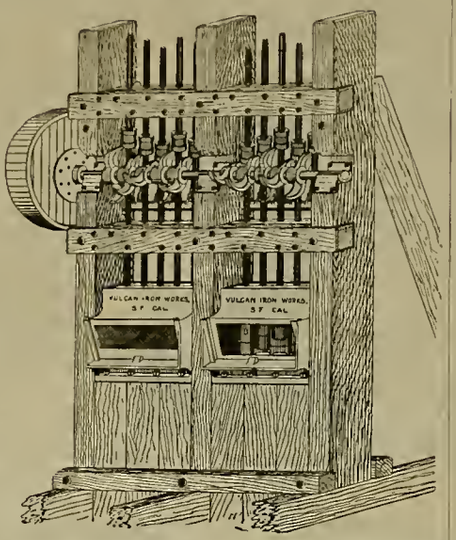

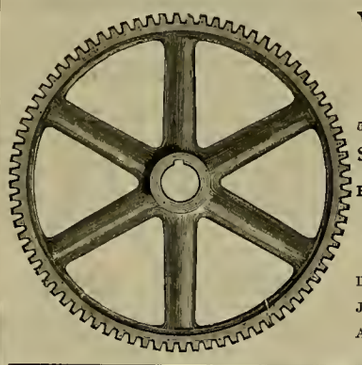

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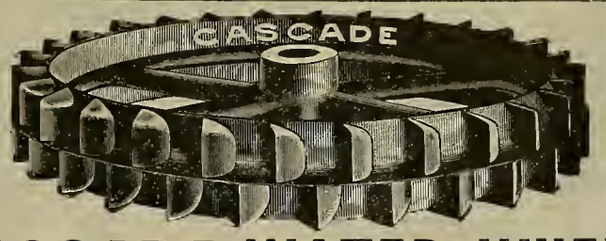

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

THE KENNEDY—JACKSON DISTRICT.—*Record:* Superintendent Parks of the Kennedy is a great prospector. He constantly has men at work opening up new ground and prospectiug the ledge, no matter how well the mine may he paying at the time. The south shaft has heen sunk 200 feet recently, making it now 1750 feet with a seventy foot sump, vertical depth or nearly 2500 feet length of shaft. Sinking is soon to he commenced at the north shaft to carry it dowu 200 feet, that is to the same depth as the south shaft. During the past week some repairs to the north shaft preparatory to heginniug sinking have tied up the north skips and the greatest portion of the work has heen done at the south shaft. As soon as the sinking is completed at the north shaft they will crosscut to the ledge, counecting the crosscuts hy a drift. The additional depth of the Kennedy shaft makes it the deepest mine working on the mother lode, and prohahly the deepest in the State.

Trinity.

CHLORIDE QUARTZ MILL CRUSHED.—James and Charles Gilzean have leased the Bailey mines at Dedrick and intended to stop at the mines and work through the winter, hut gave it up as the snow was getting too deep and was sliding in all directions. All around the cahins the snow was eight to ten feet deep. On the 20th ult. says the *Journal* a snow slide started across the creek, surged up the hill and struck the little house covering the Pelton water wheel which runs the Chloride quartz mill, knocking that down. The mill itself then fell but did not slide. The snow covered everything hut the mill was not much injured. This is the third time that this mill has heen wrecked hy suow. Once at Deadwood wheu Ballou owned it aud once in the winter of '91 and '92, when a snow slide swept it from its preseut site and spread it along the creek and ravine for a mile.

ARIZONA.

CHERRY CREEK.—*Courier:* D. E. Dumas has heen in town for the past few days paying out money made from ore which he arrastraed from his gold claims on Cherry creek. The ore yielded $25 per ton and the concentrates contain at least $100 or more per ton. A concentrator is badly needed for that camp. He has a vein of from two or three feet of pay ore in his mines. Three quartz mills will prohahly soon he in operation on the creek. The De Kuhn mill, leased by Major Watts, the Conger mill and the Barshaw mill.

Messrs. Sines and Smith have struck it rich in their Cherry mine and have exposed, near the surface, a pay streak twenty inches wide which pans not less that $200 per ton gold. A shipment of several tons of ore from the mine is now at the sampler.

TIN MINE.—Cap. Jones, a prospector, has located a tin mine 125 miles from Yuma and fifteen miles from the Colorado river. The ore is a grayish hlack and specimens sent to various cities show that the ore is about ten per cent tin. The Temescal mines run one aud one-half per cent tin. The ore lies in a hed, apparently of several hundred acres, and appears to have slid dowu a mountain. It is mixed with red and yellow oxides, and is covered with layers of quartz and talque.

ALASKA.

At Seward City, the additional twenty stamps are finished. The Bear mine tunnel has heen driven 135 feet, and has now 310 feet more to go to tap the ledge at a point ahout 300 feet under the old workings. A winze is heing sunk on the ledge to connect the two tunnels run formerly hy the German company in the Bear mine, and the ore has increased in grade.

At the Comet miue the hottom level is driven ahead continually in high-grade ore that assays more than that taken from the top levels. One hundred feet from the face of the bottom level a crosscut is going ahead to tap Comet ledge No. 2, located farther up the hill. This will furnish extensive stoping ground. At present the Comet mine has a finer showing of ore in sight than at any time in its development. Gold hullion shipments are made from the mill twice a month.

THE YUKON COUNTRY.—Writing from Hunter's creek, in the Yukon River region, to the *Record*, a miner says the stream is 150 miles above the mouth of the Tananah river and 750 miles helow the mouth of Forty Mile. Fourteen white men are working there on the hars with very good success. The hedrock so far as known is from three to six feet under surface. The miners have averaged from one to one and one-half oxs. per day, and of course the pay will increase as they get their claims opened up.

During the summer the miners hecame alarmed, fearing they wonld run out of provisions, and stationed a watch on the hank of the Yukon to hail any passing hoat with supplies. Healy & Hamiltou's steamer came along and supplied the camp with $3,000 worth of grub, the miners planking down the gold dust for the same.

Hunter's creek is ahout fourteen miles in length. The rich discoveries on the Yukon this year are the following creeks: Ahout 200 miles helow Forty Mile are four rich creeks, named the Independent, Miller, Mastodon and Mammoth. It is said that the creeks exceed in richness the former discoveries on Forty Mile or Miller creeks, the miners so far averaging from two and one-half to three and one-half ozs. per day. Some miners here have taken up two and three claims though it is not likely that more than one can be held, hut on account of the great richness of the ground the men are much excited. These claims are 500 feet long and run the full width of the creeks, which pay the full width. This is the reason this creek is so much more valuahle than others. Hundreds of claims just as good as those staked out are still opeu for location. Claim operators are offering $16 a day for men with none to he had at that rate of wages. Well-posted miners say there will be work for 1000 men for the next ten to fifteen years. There is an ahundance of water with a good fall. Bedrock is nowhere more than five feet helow the surface. There is already a heautiful townsite located on the hanks of the Yukon and ahout 100 houses in course of construction. The mines are ahout fifty miles from here and of course all supplies of every sort have to he packed there.

No man should come to the Yukon country with less than $300 to $500 after paying all expenses to Forty Mile. Too much emphasis cannot he given to this warning. Credit for supplies is a thing of the past and cannot he expected again in this region.

BRITISH COLUMBIA.

TOO MUCH EXAGGERATION.—For several weeks past the provincial papers have heen puhlishing exaggerated accounts of the great gold finds ou Kaslo creek, says the Kootenai *Mail*. Such yarns will not only injure Kaslo, but the whole district. It is on a par with the exaggerated reports about the gold (placer and quartz) found in the Carihoo creek district, recently hlazoned to the world hy local contemporaries. The Kaslo correspondent of the Vancouver *World* thinks enough harm has heen done the town by this "besetting sin of western journalism," and calls a halt in the columns of that journal.

IDAHO.

Word from Silver City is to the effect that wonderfully rich ore bodies have heen encountered in the Tip Top mine. Assays from a streak fifteen inches wide, which extends to the 100-foot level and possihly farther, weut $500 in gold and 8,000 ounces of silver a ton. The lode is from thirty-five to forty feet wide. The Tip Top is owned by Colonel G. V. Bryau, formerly of Hailey, and G. W. Venahle of New York, who also owns the Red Elephant.

NEVADA.

Eureka District.

RICHMOND CON. MINING CO.—At the annual meeting in London receutly the chairmau stated that the output for the year ending February 28th last was 674 ozs. of gold, 27,389 ozs. of silver and 250 tons of lead. The mine has been worked for most part hy tributers and a considerahle quantity of ore taken out, but none of the rich pockets fouud which had distinguished the miue in the past. The ore has heen shipped and sold to the smelters at Salt Lake. The chairman advised against any further expeuditure in the effort to find new mines and helieves that more could he done by continuing to explore the Richmond mine itself. The balance of revenue on hand was sufficient to pay a dividend of 1s per share. The statement of the chairman and the report were approved hy the stockholders.

Washoe District.

ON THE COMSTOCK.—The official report of the work done in the Cousolidated California and Virginia mine last week is as follows: 1650-foot level—We have continued to stope ore from the new ore body, ahove and below the sill floor of this level, from the sixth floor up to the eleventh floor and on the eleventh floor have opened out two more sets of timhers to the south in good ore, making ten sets in all from north to south. From the south face on the eleventh floor, in the southwest corner, we have opeued out three sets of timbers upward. The twelfth floor carries five feet of good ore lying against the west or footwall, and the south face on this floor is in ore of good quality. 1700-foot level—In working upward from the sill floor of this level and outward to the north and south we have continued to extract good ore. 1750-foot level—From the sill floor of this level on the uorth side of the winze sunk from the 1700-foot level, our stoping in the ore hody has heen carried up to the fifth floor, and from the second to the fifth floor we have extracted 130 tons of ore assaying on the average $24.74 per ton. From all of these openings we have extracted duriug the week 300 tons of ore, the average value of which per mine car samples was $54.47 per ton. Shipped to the Morgan mill 340 tons and 860 pounds of ore, the average value of which per railroad car samples was $50.85 per ton. The average assay value per hattery samples of all the ore worked at that mill during the week—175 tons—was $49.67 per ton.

In the Ophir mine in the 1465 level workings some ore giving low assays is still heing found. In the Central tunnel workings on the 250 level a winze is being sunk at a point 80 feet in from the mouth of the southeast drift. On the 29th it was down 7 feet, and 17 tons of ore assayiug $21.52 per tou had heen extracted from it during the week. Porphyry carrying fine lines of quartz is heing cut in the northwesterly workings 117 feet ahove the tunnel level. The usual work has heen doue in the Mexican, Union Con., Sierra Nevada and Andes miues without important changes in formation. The joint Best & Belcher and Gould & Curry incline winze helow the 200-foot level of those mines is down 70 feet, passing through hard porphyry and quartz. In the Hale & Norcross mine the streak of ore in the face of the north drift on the 975 level is still holding out, and is of good quality. During the week three carloads of ore assaying $50.33 per ton were extracted. The winze on the 450 level of the Chollar mine, 350 feet south of the north line, is down 42 feet; bottom in fair-grade ore. Are stoping ore from the north end between the 450 and 550 levels. During the past week we have shipped to the Nevada mill for reduction 249 tons and 100 pounds of ore, the average hattery assays of which were $31.25. In the Potosi mine the connection at the hottom of the south winze from the 450 level is completed, and are running south on a streak of fair-grade ore.

COMSTOCK BULLION OUTPUT.—*Enterprise:* Following is the report of the ore and hullion yield during the past year. The first three quarters of the year are given and an estimate of the last quarter:

Quarter Ended March 31.—Consolidated California & Virginia—Total ore yield, 683 tons and 1,390 pounds; gross hullion yield, $12,291-.20; cost of extraction, $13,617.67; cost of transportation and reduction, $4,102 17; total cost, $17 749 84.

Chollar—Total ore yield, 1,046 tons and 1,600 pounds; gross hullion yield, $16,410 01; cost of extraction, $11,992 68; cost of transportation and reduction, $6,280 80; total cost, $18,273 48.

Yellow Jacket—Total ore yield, 477 tons and 365 pounds; gross hullion yield, $7,572 23; cost of extraction, $13,348 39; cost of transportation, $480 37; cost of reduction, $2,386 82; total cost, $16,215 68.

Quarter Ended June 30.—Con. Cal. & Va.—Total ore yield, 675 tons; gross hullion yield, $24,330 58; cost of extraction, $18,546 68; transportation and reduction, $4,218 75; total cost, $52,765 43.

Hale & Norcross—Total ore yield, 749 tons and 760 pounds; gross hullion yield, $7,999 85; cost of extraction, $18,218 49; transportation and reduction, $4,596 28; total cost, $22,714 77.

Belcher—Total ore yield, 325 tons and 72 pounds; gross hullion yield, $5,519 25; cost of extraction, $14,459 57; cost of transportation, $325 72; cost of reduction, $1,628 60; total cost, $16,413 89.

Crown Point—Total ore yield, 1,054 tons and 830 pounds; gross hullion yield, $10,340 88; cost of extraction, $18,366 54; cost of transportation, $1,277 95; cost of reductiou, $2,108 83; total cost, $21,753 32.

Occidental—Total ore yield, 321 tons; gross hullion yield, $5,416; cost of extraction, $3,694; transportation and reduction, $1,926; total cost, $5,620.

Yellow Jacket —Total ore yield. 203 tons and 65 pounds; gross hullion yield, $2,745 67; cost of extraction, $15,062 15; cost of transportation, $203 06; cost of reduction, $1,015 32; total cost, $16,280 53.

Quarter Ended September 30.—Consolidated California & Virginia—Total ore yield, 5,325 tons and 470 pounds; gross hullion yield, $204,-590 29; cost of extraction, 59,866 45; cost of transportatiou and reduction, $33,282 71; total cost, $93,149 16. Net yield or value on which taxes are levied, $111,441 13; hullion tax, $5,572 05.

Crown Point—Total ore yield, 1,288 tons and 1390 pounds; gross hullion yield, $10,363 38; cost of extraction, $8,633 35; cost of transportation, $837 66; cost of reduction, $2,577 39; total cost, $12,048 41.

The yield for the last quarter ending December 31, will not he filed until February, therefore a correct statement of the yield for that quarter is not available. The report for the first three quarters of the current year show that a total of 12,149 tons of ore were produced, yielding hullion valued at $307,579. The total yield for the year, wheu all the returns are filed, will probably reach $500,000.

NEW MEXICO.

HANOVER.—*Enterprise:* The new smelting plant of the New Mexico and Arizona Smelting Co. is heing pushed toward completion as rapidly as possible. The hoilers and engines, smelting stacks and a large lot of other machinery is on the ground. The assay offices and other auxiliary huildings are completed, and most of the timbers are already framed for the main smelter huilding. The opening of this smelter means the employment of several hundred meu on claims that have lain idle for years. Many small copper properties will he opened up when the owners have an opportunity to sell their small hatches of ore close at home. The new smelting company is working several of the old Santa Rita properties and employing many miners. It is quite likely some steps will he taken ere long to re-open the deep mines of Santa Rita. The owner of the property, J. P. Whitney of Boston, was out last week to look the ground over, with a view of opening up the property.

OREGON.

THE TOWN OF SUMPTER.—At the old town of Sumpter, ten miles northwest of McEwen, the terminus of the S. V. R. R., Messrs. Ellis & Cupid are equipping their placer ground with an electric light plant, two giant hydraulics and a string of pipe 5,000 feet in length, hesides enlarging the capacity of the ditches furnishing water for the mines. They are also ereeting a new sawmill with a capacity of 20,000 feet per day, ten hours.

SOUTH DAKOTA.

Just now, says a Custer City dispatch, Keystone seems to be the coming gold camp of the west. People are flocking in from all directions, until every house in the town and stables and sheds are filled to overflowing. No such rush has heen witnessed in the hills since the palmy days of 1887. Many are compelled to sleep out under the trees. There is now thought to he ore enough in sight to insure an output of 2000 tons a day for the next twenty years. The average value of ores in all the mines is ahout $15 per ton. The gold helt of the Keystone is a mile in width hy four miles in leugth.

UTAH.

AS TO THE SMELTERS.—*Tribune:* Inquiry among the leading mine-owners and managers of Park City regarding the late action of the smelter comhine or trust and the present attitude of its members, develops the existence of a great deal of righteous indignation in the minds of our ore-producers against that avaricious monopoly.

The result of this effort of the smelter men to compel the miners to pay extortionate charges for the smelting of their ores is likely to prove disastrous to somebody. It seems strange that, at this time, when silver and lead are selling at the lowest price in the history of the country, when the margin of profit in the ores of the most of our miues is merely nominal, when to retain any margin whatever of profit the mines have been compelled to reduce wages to the lowest point compatihle with decent living and to reduce expenses in every direction possihle, that just now the smelters should attempt to raise the smelting charges and to increase their already handsome profits. It seems incredible that there can he any necessity for this advance in charges. The smelters are certainly not paying any higher wages, and general supplies should be cheaper than heretofore.

Do they expect the mines to run at a loss, or do they anticipate that the wages of the men who handle the pick and drill will be reduced even below the preseut standard? It is much more likely that the mines will shut down, that the honest miner will be thrown out of employment, and that hitter suffering will be the portion of his wife and children.

Take, for instance, the great Anchor mine, with its immense hodies of low-grade ore, and whose ore at the present time pays a profit of less than $3 per ton even at the low rate of wages paid in that property. Is it reasonable to presume that this property can continue to operate under an increased charge of $2 per ton for the smeltiug of its ore? Are not the smelters pursuing the policy of "killing the goose that lays the golden egg?"

Already several informal meetings of the local mining magnates have been quite thoroughly discussed, and the consensus of oponion is that a convention of the ore-producers of the Territory should he called at once for the purpose of considering ways and means hy which the miners can be emancipated from the fetters that are being forged on their hauds hy the great smelter combination.

The mine-owners of Park City stand ready to unite with the other ore-producers of the Territory, or of the whole intermountain country, and put up money, if necessary, to huild smelters in Salt Lake valley or elsewhere to smelt their own ore and extricate themselves once and for all from the clutches of the smelter trust.

Should the opinion prevail that it would he hetter to close all the mines indefinitely, they will, if they do not close their own mines, guarantee not to submit to the rule of the smelter trust. In fact on this last proposition they seem determined, in any event, to refuse to make any contracts dictated hy the smelter combination.

THE SMELTERS' STATEMENT.—The smelting men in Salt Lake still emphatically deny that there is any combine hetween them as to smelting charges or prices of ore. They explain that their hids are based upon their need; that is, if they are short on a certain class of ore, they will bid high to get it, and if they do not need it they will not make any especial exertion to secure it. The result will he that some ore-producers will receive more than last year and others will receive less, but the smelting men do not think the average will fall much if any, below that of the last year.

WYOMING.

J. C. Davis, one of the Senatorial aspirants, speaking of the outlook for the State, said: "I am more hopeful over the outlook in Wyoming than I have heen in several years. There is every indication that there will be a great deal of development work done in the State next season. I have just let a contract for $15,000 worth of work to he done on the Penn mine in the Seminoe country, in Carbon county. Colorado parties have made several handsome offers for this property, but the owners intend to develop it themselves. The Four Mile placer claims are attracting much attention, and there is a hig demand for the ore from the iron mines near Rawlins. It is the finest fluxing ore that the Denver smelters can secure. There is no reason why 75,000 tons of it cannot be utilized for this purpose every year. The Union Pacific Company has completed a survey of a spur to the mines. It can be huilt for $10,000."

Coast Industrial Notes.

—Expert Moore figures that the Santa Fe system must expend $4,000,000 withiu the next five years to keep up its road aud rolling stock. Of this amount the A. & P. will have to expend $2,380,000—$1,706,200 for new rails.

—California has 333,310 milch cows, and each will average 3750 pounds of milk or 150 pounds of butter per year. The produce of 106,666 cows is consumed as milk; that of 19,200 into cheese, and that of 207,444 is made into hutter.

—The Mexican Northern railroad is to he extended from Sierra Mojada to the rich mining camp of Carmen on the Rio Grande horder, and thence across Presidio county, Tex., to Marathon, where connection will be made with the Southeru Pacific.

—The San Diego, Pacific and Eastern Railroad Company has incorporated. Capital stock $1,000,000. The object of the incorporation is to huild a railroad from San Diego northeasterly through El Cajon valley and to San Felipe pass, with a diverting road also from El Cajon valley via Poway to Escondido.

—The long-talked-of electric railroad hetween Los Angeles aud Santa Monica is rapidly approaching materialization. The plan is the utilization of the old Los Angeles and Pacific Railroad hy a corporation, which is understood to he practically the same as the Los Angeles Consolidated Company. A contract of sale has heen signed hy the owners of the old Los Angeles and Pacific wherehy, on certain terms, they transfer all the property to Mr. Stevens of this city, who is operating in hehalf of the Los Angeles and Pasadena Elec-

trie Railway Company, which is part of the Consolidated, the object being to make a continuous line through Los Angeles from the mountains to the sea.

—Capital has been secured for carrying out the plans for car works, blast furnace and steel works at Salmon bay, Puget Sound. D. H. Gilman of Seattle is at the head of the enterprise. It will require $3,000,000 of capital and give employment to 3000 men. It is proposed to secure motive power by generating electricity at Snoqualmie Falls, and a company already has been organized for this purpose.

—There are two values in flax—fiber and the seed. Our Northwest Pacific States are the best flax-growing district in the world. Many years ago the fiber was extolled by exports who saw it. But we were distant from market and did not press this branch of industry. Conditions are changing now, and the products of flax, fiber and seed or oil, will now or soon bear transport. This is one of the industries to be studied in these States.

—The Monterey & Fresno Railroad is designed to afford direct railroad transportation from Fresno to Monterey. Preliminary surveys have been made for the entire line—171 miles—and the permanent location of the greater part of the route has been completed. In July last, forty-six miles, from Monterey bay east, were put under contract and work on this division is progressing, with nine miles now graded ready for the track. The line will pass through Salinas, San Juan, Hollister, Firebaugh and Madera. It is expected to push work vigorously during 1895.

—The biennial report of the State Board of Fish Commissioners for 1893-4 states that California ranks sixth in the Union, with products valued at $3,044,310 with an annual appropriation of $8750, while Massachusetts ranks first, with an appropriation of $15,700 per annum. It has been stated that Eastern States required greater appropriations in this direction on account of greater population, but the report says the reverse is true, as the expense of protection is almost nothing in densely populated regions. The Commission recommends the appointment of a game warden in each county.

—The Columbian Colonization Company is incorporated by J. W. Wilson, H. P. Sweet and J. G. Foster to irrigate and colonize a tract of government land in San Bernardino county, on the Atlantic & Pacific and the Southern California Railroads, and on branches of the Santa Fe system. At the upper narrows at Victor on the Southern California Railway, the river flows through a gorge 300 feet deep and 150 feet wide. By building a dam 150 feet high at this point the company propose to obtain a water supply sufficient to irrigate 340,000 acres of desert land. It is their intention to lay out a city to be called Columbia, with water power for electric plants, a beet-sugar factory, canaigre works, a creamery and a cold-storage warehouse. The capital stock is $4,000,000.

—It is stated at Union Pacific headquarters that for some time past it has been the ambition of Receiver McNeill of the O. R. & N. Co. to bring about a separate receivership for the Oregon Short Line and Utah Northern with the Oregon Navigation Company, thereby making the two roads an independent system. But the scheme was not to end there. A California line was to be secured by extending the branch a distance of 400 miles, connecting the O. R. & N. Co., thus giving the company a through line from Huntington to the coast via Portland. For months this has been the dream of Major McNeill, but when he broached the subject of independent line to Mr. Boissevan, who has large interests in both properties, it is understood that gentleman told the Navigation Company's receiver he was entirely satisfied to have the management in the control of the Union Pacific.

—A conservative epitome of California productions in '94 show that California mines yielded $18,000,000 in the preceding twelve months, of which over $12,000,000 was gold; the value of the salt product in 1894 was $120,000; borax product, 1894, $860,000; mineral waters, $300,000; natural gas, $90,000; petroleum and bitumen products, $1,250,000; quicksilver, 26,400 flasks; value of San Francisco manufactures in 1894, $83,310,000; beet sugar produced, 35,000,000 pounds; wheat crop, 22,414,900 bushels; brandy distilled from grapes, 1,300,000 gallons; California canned fruit, 1,240,000 cases; barley crop, 5,060,000 bushels; bean crop, 72,000,000 pounds; raisin crop, 54,600,000 pounds; dried fruit product, 125,000,000 pounds; prune crop, 32,500,000 pounds; wool product, 26,000,000 pounds; hop product, 40,000 bales; orange crop, 10,000 carloads; butter, 50,000,000 pounds; cheese, 15,000,000 pounds.

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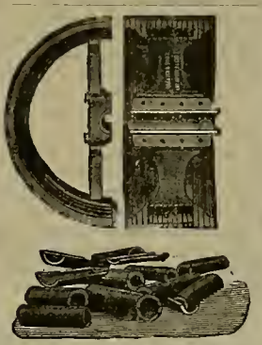

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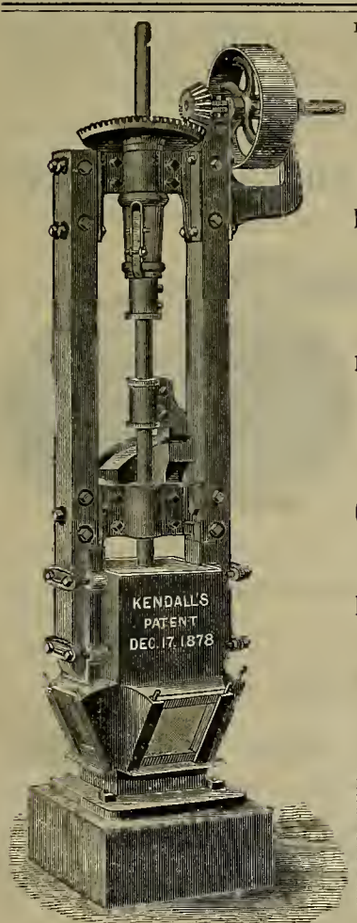

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Electrical Progress.

Direct Conversion of Light Into Electricity.

At the last meeting of the Societe Iuternationale des Electricians, M. Ch. Marechal showed experimentally, hy means of an electro-chemical actinometer, that luminous energy is transformed into electrical euergy mechanically—availahle even at long distances—not through the calorific or chemical power of the light, but hy virtue of a third force, which the writer calls actiuic foree.

This transformation is effected in all the divisions of the spectrum, but depends on the coloring matter employed for sensitizing the plates of the actinometer, the sensitivcuess of which is so great that the light of the candle at a distance of some meters produces effects that are as clear as they are instantaneous.

After diseussing certain applications to telegraphy and photography, M. Marechal in an hypothesis which, though bold, is based on facts ascertained by ohservation and experience, shows once more the close connection hetween electrical and luminous phenomena; then he showed the intimate relations existing hetween solar light and the great natural phenomena, such as terrestrial magnetism, the different variations of the magnetic needle, the aurora horcalis, earth currents, etc.

This would seem to mark the beginning of a new epoch in optical physics and to open new avenues of investigation which may lead to the most important results. While this hrief notice, which is all we have at present, suggests nothing incompatible with our present heliefs or the teachiugs of Maxwell, it seems likely to give those teachings a new significance and to give them a eoncrete value that they have not heretofore possessed.

France Encourages Electrical Progress.

Frauce has for somc time past bceu specially active in the application of electric power to cauals, a fact due probably to the importanee aud extent of her canal system. The latest sucessful trial reported is one on the canal hoats of the Havre-Paris-Lyons compaignie, in which a trausferahle electric motor and rudder combination is used, while the motor has been driven hy current from storage hatteries. The caual boat, haviug a length of thirty-eight meters and carrying 180 tons, is driven at a speed of eighty-five centimeters per second, an iucrease of forty per cent over the speed with two horses, while the electrical energy consumed was about four aud six-tenths horse power. At times a speed of one meter (three feet three inches) per second was obtained. It is now proposed to employ also a trolley system, as on the Bourgogue canal, and to let the feed water that maintains the levels at the proper height operate dynamos generating the necessary current. France has always heen foremost in the application of electricity to navigation.

A COMMON EXPERIENCE among those who have to do with electrical machinery is the paralyzing effect which the electric curreut exerts upon an ordinary watch. The mechanism of most watches being of hard steel, highly polished, renders them peculiarly sensitive to magnetic influence, and consequently unreliahle as timekeepers. Formerly non-magnetizahle watches were regarded as little more than a uovelty; now, however, the rapid spread of electricity in its multifarious forms has made them a necessity.

DR. WELLINGTON ADAMS, president of the Chicago and St. Louis electric road, says the road " will most certainly he huilt, hut not uutil after a revival in business. Already $8,000,000 of the $10,000,000 worth of honds have been placed, and it will not he much trouble to place the remainder. The grading and securing of right of way is going steadily on."

An Explosion in an Iron Foundry.

The explosive power of water when suddenly converted into steam may not be thoroughly understood or even fully comprehended by some mechanics, and an explosion that wrecked a foundry was caused by a lack of just such knowledge on the part of the foundrymen. Pouring off is always done at the end of the day, and sometimes it is late at night before the bottom is dropped and the furnaceman at liherty to go home. Under such conditions it is not strange that a man would do all that he could to hurry up things, that he might get away early.

It is the custom, in most foundries, to throw several pails of water on the pile of slag and cinder that comes down, red hot, upon the sand which has been placed under the cupola to receive that which falls when the hottom is dropped. A shallow cavity is hollowed out of the sand to receive the slag, and several pails of water, or a stream from the hose, deadens the intense heat radiated from the pile of glowing matter. It is supposed that the cupola man, in order to get away sooner, hit upon the expedient of getting the water ready beforehand, so he would have less to do after the bottom came down. Accordingly, the hole scooped in the sand underneath the cupola was half filled with water, and at a given signal the prop was pulled away and the bottom came down. Then the explosion occurred, wrecking the building, killiug and wounding several workmen and setting the wreck on fire. It was caused by the water hecoming suddenly expanded into a gas, which occupied many times the space filled hy water.

We can throw a pail of water into a cupola charged with molten iron, and no explosion will occur which can amount to much. But confine that water in a pipe and plunge the pipe into melted irou and there will be the livelicst kind of an explosion as soon as the heat gets well at the euclosed water. It is this thing which sometimes causes the disastrous explosions in cupolas, when pistons and other apparently harmless pieces of iron explode with terrihle force and damage.—Scientific Machinist.

Machinery of a Cruiser.

The extent and power of machinery construction are wonderfully exhihited in the working equipments of the latest Government cruiser. There are 61 separate engines, not counting cylinders, which would run up to 120, for main, auxiliary and pumping purposes. The low-pressure piston is 92 inches in diameter, and an area of 46 square feet and an initial load of 100 tons. The condenser tubes, if placed end to end, would form a tuhe 33 miles long, and the cooling water passed through these tubes equals 36,000,000 gallons per day, or enough to supply a large city with water. The main boilers, if placed end to end, would form a tunnel 156 feet long and large enough for a train of cars to pass through. The heating surface is equal to 1½ acres.

Armor Plate for Russia.

The Bethlehem, Pennsylvania, Iron Compauy has the whole contract for supplying armor for Russia's two new battle ships, the Sebastopol aud Petropalovak. The contract calls for something over 12,000 tons of armor plate to fit up the two ships. It amounts to about $4,000,000. The American company secured the contract over fourteen eompetitors, comprising the armor plate manufacturers in the United States, England, France, Italy and Germauy. The contract is regarded the largest ever awarded in Europe.

UNITARIAN LITERATURE sent free by the Channing Auxiliary of the First Unitarian Church, cor. Geary and Franklin Sts., San Francisco. Address as above. Mention this paper. *

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It is strong, durable, reliable, simple, compact, light, easily handled and operated by one man, and will reduce the cost of rock drilling at least Fifty per cent.

Our handsomely illustrated pocket catalogue fully explains the features and workings of the drill. It should be in the hands of every mine owner, leaser, contractor and prospect or in the West. *Sent free on application.*

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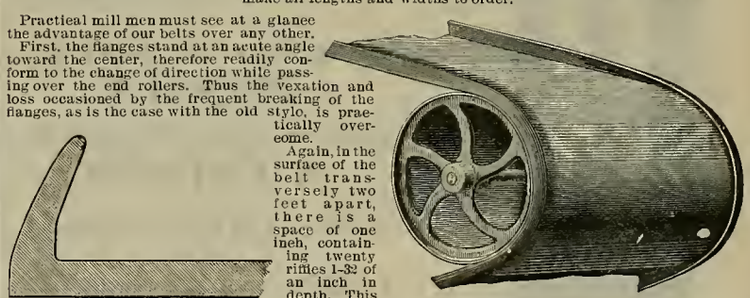
Blasdel Improved Concentrating Belt.

We keep in stock belts suitable for the Frue, Triumph, Johnston and Tulloch machines, and make all lengths and widths to order.



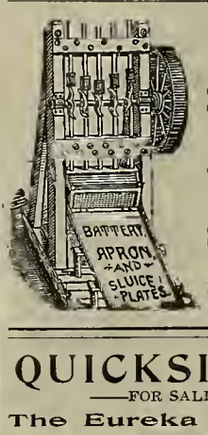
Practical mill men must see at a glance the advantage of our belts over any other.

First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old stylo, is practically overcome.

Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

H. G. BLASDEL, JR., Manager,

419 California Street, Haywards Building.....San Francisco.



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611 and 613 FRONT ST., San Francisco, Cal.

Practical Information.

Wages of Steamship Building.

The following report shows the rate of wages paid by Clyde builders of ocean steamships and by steamship owners, and are printed in Consular Reports. The rates given are by the hour:

Description.	Wages. Pence.	
Engineers, general	6½	$0.13
Pattern makers	6¾	.13½
Machinists, in engineer shop	6	.12
Boiler makers	8	.16
Plumbers	8	.16
Pipe fitters	6¾	.13½
Shipwrights	7½	.15
Ship joiners	7¼	.14½
Drillers	8½	.17
Fitters-up	9¼	.18½
Riveters	10	.20
Calkers	9	.18
Painters	7½	.15
Furnace men	6	.12
Sheet-iron workers, general	6½	.13
Coppersmiths	7¾	.15½
Iron molders	7½	.15
Brass molders	8	.16
Blacksmiths	7½	.18
Laborers	5	.10
Frame setters	8½	.17

The hours of labor are fifty-four per week for about forty-eight weeks in the year. The ships are nearly all constructed of steel. Iron vessels are now as rarely built there as wooden ships. Several of the trades mentioned are employed by the piece. These include the riveters, platers, frame setters, fitters and calkers. The riveters work in squads, consisting of two riveters, a holder-on and a rivet boy, and they are paid at the rate of so much per hundred rivets put in. The larger the vessel the higher the rate, and special prices are paid for riveting keels and stringer plates. A steamer of over 5000 tons commands extra wages. On ordinary vessels good squads (two riveters, a holder-up and a rivet boy) will make at present about $6.68 per day, but the average for Government work is above this. The piece men are sometimes irregular in their employment, and, if overtime is excluded, do not work more than five days per week.

The shipwrights have a standard wage of fifteen cents per hour, but the joiners, blacksmiths and engineers have what is known as a sliding scale.

In the case of engineers the pay varies from twelve to thirteen and a half cents per hour, blacksmiths from twelve to sixteen cents per hour.

The Speed of Trolley Cars.

The speed of a trolley car when passing any given point has been a matter upon the determination of which a good deal of discussion has been expended. To put a revolution counter upon the axle would solve the problem, but it is frequently desirable to ascertain the speed of a car without the assistance of a street car company. Particularly is this desirable when seeking evidence that the cars are being run at a higher rate of speed than allowed by law. It is well known that the motor gives forth a peculiar sound when the car is running. This sound Whittier in his poem on "The Broomstick Train" likened to the purring of a witch's cat, and it is in this purring sound that the speed indication lies. Whenever a number of blows or taps are delivered in regular sequence, they will, if their frequency be great enough, form a musical note. The reason for this is, that the ear cannot rid itself of one sound before another reaches it; consequently when the number of notes rises above a certain number per second, a musical note is the result. The eye possesses a similar faculty called "persistence of vision," which makes the firebrand give an apparently continuous circle of fire when whirled swiftly about. About one-sixtieth of a second is said to be the limit of persistence of vision, and thirty sound vibrations per minute are probably the least number which the ear can recognize. The lowest note on a seven-octave piano has about thirty-three vibrations per second, and middle C about 246. It is the striking or meshing of the gear and pinion teeth which causes the "purring" of the street car motor, and if the tone caused by the meshing teeth has a pitch of "middle C," we know that 264 teeth are meshing per second. Then the number of teeth on gear being known, also the diameter of the car wheel, it is comparatively easy to calculate the speed of the car at the instant the sound observation was made, in spite of all efforts of the company to prevent the car speed from being known.—Cassier's Magazine.

Doesn't Pay to Pick Up Nails.

A very striking illustration of what the low cost of manufactures of iron and steel really means is furnished by a remark incidentally made by William Garrett, of Joliet, Ill., the famous inventor of the rod mill which bears his name. In a lecture at Joliet, says the *Iron Age*, he stated that "wire nails are sold so cheaply that it is estimated that if a carpenter drops a nail it is cheaper to let it lie than to consume the carpenter's time to lift and use it, and it is claimed by good authority that one keg out of five is never used but goes to waste." We have had the curiosity to do some figuring on the proposition made. Assuming that it takes a carpenter ten seconds to pick up a nail which he has dropped, and that his time is worth thirty cents an hour, the recovery of the nail would cost 0.083 cent. There are 200 six-penny nails in a pound, which is worth, at 90 cents base and 65-cent average per keg, 1.55 cents per pound. This would make the money value of the individual nail 0.0077 cent. Or in other words it would not pay to pick up ten nails, if it took ten seconds of time worth thirty cents an hour to do it in.

No. 10.

FRASER & CHALMERS

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Robert Duncan Jr Supt

OFFICE OF THE ALASKA TREADWELL GOLD MINING COMPANY

Alaska Mexican Gold M'g. Co.

Douglas Island, Alaska, July 31st. 18¾.

William J. Chalmers Esqr.
Pres. Fraser & Chalmers.
Chicago. Ill.

Dear Sir:-

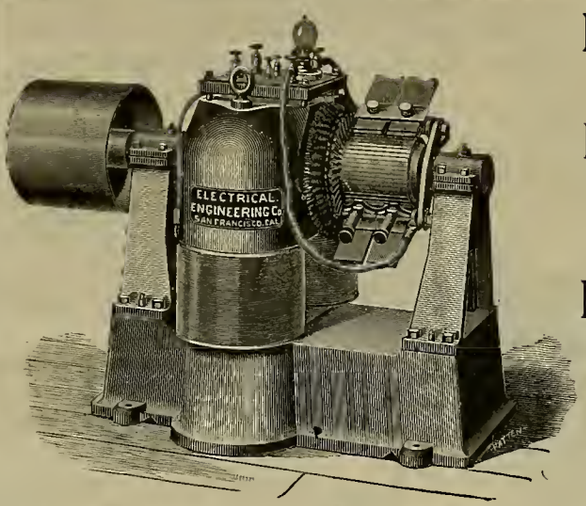
Your letter of July 7th. is duly received.

In regard to your enquiry regarding our Riedler Compressor, supplied by your Coy, over eight months ago, I must say, that the Compressor is giving excellent results, and every satisfaction, while running either by steam, or water power.

During the last twelve years, I have seen operated, and have operated, many different makes of air Compressors, including the Eclipse, Reliance, Burleigh, National, Rix, & Firth, Ingersoll Sargent, etc. etc. and in no instance, have any of the above given the results of the Riedler. Therefore, I have no hesitation in saying that the Riedler, is the best, and most economical Compressor on the market today. We have made comparitive tests here, of the Ingersol Sargent, and Riedler, which show, greatly in favour of the Riedler.

Yours very truly,

Robt. Duncan Jr.
Supt.



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Market Reports.

The Markets.

SAN FRANCISCO, Jan. 3, 1895.

The eclipse of '94 still surrounds lead and silver, "sixty and three" heing the continued quotation. Neither the proposed Japan loan nor Congressional action or inaction seem to affect the morihund market. Kansas City and New York men have this week shipped large quantities of har silver to the City of Mexico, to he coined at the Government mints into Mexican silver dollars. Transportation and mintage charges amount to nearly seven per cent. A member of the shipping firms says: "The Mexican silver dollar is at a premium of ahout seven per cent and foreign exchange in Mexico is at a discount of about seven per cent, a condition the reverse of that which now prevails in the United States. This is illustrative of the fact that countries on a silver hasis are prospering on the low price of silver, while gold-hasis countries are suffering."

A circular issued hy the freight department of the Southern Pacific to its agents states that, until further advices, the rate of exchange hetween Mexican and American money will he $2.02. Fractions of five-tenths or over will he considered one cent, and fractions of less than five-tenths will he dropped.

New York Prices.

NEW YORK, Jan. 3.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	27¼	60	9 50	3 00
Saturday	27¼	59⅝	9 40	3 03
Monday	27¼	59⅝	....	.....
Tuesday	....	....	....	.....
Wednesday	27½	59¾	....	.....
Thursday	27½	59¾	....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	12½c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.89½
Refined Silver, per ounce	59¾
Mexican Dollars, nominal	50½@51

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lh	—	@	10
BORAX.			
Refined, in car lots	—	@	6¾
Powdered, "	—	@	6¾
Concentrated, "	—	@	6¼
COPPER.			
Bolt	20	@	—
Sheathing	21	@	—
Ingot, johhing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per hx	5 25	@	5 50
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	16	@	18
PIG TIN.			
Per lh	17	@	—
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 95
Bar	—	@	4 25
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per hag of 25 lhs			$1 25
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do, "		"	1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 50
West Hartley			8 00
TO ARRIVE—PER TON.			
Australian	5 25	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 62½	@	— —
Cardiff	6 37½	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 50	@	— —
Egg, hard	9 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in hulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

How the mysterious principle of life fights to maintain the heat of a body, and then finally surrenders, is curiously illustrated by Pictet, the Genevese chemist. A dog placed in a copper receiver, kept at from 75° to 130° below zero Fahr., became warmer than when he was put in by half a degree during the first ten minutes; and after an hour and a half he was only one degree colder. But soon afterward the animal suddenly died.

A WORLD'S FAIR will be held in Amsterdam this year, opening on May 1st and closing on November 1st. Montreal proposes to hold one in 1896, Baltimore in 1897 and Paris soon afterward.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied,	Delinq't and Sale.		Secretary.
Alta S M Co, Nev	48	10c	Nov 28,	Jan 3,	Jan 24	J E Jacobus, 309 Montgomery
Best & Belcher M Co, Nev	57	25c	Nov 12,	Dec 18,	Jan 8	M Jaffe, 309 Montgomery
Bulwer Con M Co, Cal	10	5c	Dec 11,	Jan 16,	Feb 15	J E Jacobus, 309 Montgomery
Gray Eagle M Co, Cal	38	5c	Nov 12,	Dec 14,	Jan 11	C C Harvey, 309 Montgomery
Hale & Norcross, Nev	106	25c	Nov 23,	Dec 29,	Jan 23	A B Thompson, 309 Montgomery
Kentuck Con, Nev	72	10c	Nov 14,	Dec 19,	Jan 9	G D Edwards, 414 California
Mexican G & S M Co, Nev	51	25c	Dec 5,	Jan 8,	Jan 29	C E Elliot, 309 Montgomery
Mono G M Co, Cal	34	15c	Nov 19,	Dec 27,	Jan 21	M E Willis. 309 Montgomery
Ophir S M Co, Nevada	64	25c	Dec 10,	Jan 14,	Feb 4	R B Holmes, 309 Montgomery
Overman S M Co, Nev	72	10c	Nov 14,	Dec 19,	Jan 9	G D Edwards, 414 California
Potosi M Co, Nevada	43	25c	Dec 11,	Jan 14,	Feb 5	C E Elliot, 309 Montgomery
Savage M Co, Nev	85	20c	Dec 4,	Jan 7,	Jan 28	E B Holmes, 309 Montgomery
Silver Hill, Nev	34	5c	Nov 19,	Dec 26,	Jan 16	D C Bates, 309 Montgomery
Union Con S M Co, Nev	50	20c	Nov 22,	Dec 27,	Jan 16	C C Harvey, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Bullion M Co, Nev	R R Grayson, 331 Pine	Jan 10
Sierra Nevada M Co, Nev	E L Parker, 309 Montgomery	Jan 16
Silver King M Co, Nev	J W Pew, 310 Pine	Jan 8

Mining Share Market.

SAN FRANCISCO, Jan. 3, 1895.

The regular holiday demoralization, added to an apathetic market, made a depressing total for the old year. '95 opens hetter, there heing a noticeable improvement in value and volume. Work has heen resumed in the Seg. Belcher, Kentuck, Crown Point and Yellow Jacket. Crown Point is shipping ore to the Mexican mill, and the Con. Cal. and Va. to the Morgan mill. During the last month of '94, local mining incorporations disbursed $114,000 in dividends.

The following illustrates the changes of the week:

Mines.	27	3
Alpha	....	$ 12
Alta Consolidated	$ 24	....
Andes	36	36
Belcher	....	68
Best & Belcher	96	97
Bodie	66	80
Bullion	....	23
Challenge	37	....
Chollar	40	52
Confidence	....	85
Consolidated California and Virginia	3 70	3 80
Consolidated New York	....	....
Crown Point	73	70
Exchequer	....	....
Gould & Curry	43	42
Hale & Norcross	90	1 15
Justice	22	24
Mexican	64	64
Ophir	1 60	1 60
Overman	21	22
Potosi	33	39
Savage	32	27
Sierra Nevada	51	55
Union	54	....
Utah	....	....
Yellow Jacket	40	42

San Francisco Stock Board Sales.

SAN FRANCISCO, Jan. 3, 1895.

9:30 A. M. SESSION.

700 Alpha	12	300 Kentuck	08
500 Alta	44	900 L. Wash	08
150 Belcher	68	300 Mexican	64
350 Best & Belcher	97	350 Ophir	1 70
100 Bulliou	23	500 Overman	22
100 Bulwer	05	100 Potosi	39
100 Chollar	52	200	38
100 Con Cal & Va	3 80	500 Savage	35
20 Confidence	85	200 S. B. & M	23
100 Gould & Curry	42	200 Sierra Nevada	54
200 Hale & Norcross	1 10	600 Yellow Jacket	41
250	1 15	50	42

SECOND SESSION—2:30 P. M.

100 Alpha	12	100 G & C	41
700 Alta	41	850	40
200	42	500 Hale & Norcross	1 15
100 Andes	36	100	1 10
200 Belcher	67	200 Justice	24
100	66	100 Kentuck	08
100 Best & Belcher	95	500 L Wash	08
250 Bodie	80	500 Mexican	61
100 Bullion	22	100 Potosi	36
50	21	100 Savage	34
60 C. C. V	3 75	50 Sierra Nevada	55
200 Crown Point	70	500 Yellow Jacket	42

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CAN-TESTING MACHINE.—Joseph Black, San Francisco, Cal. No. 531,616. Dated Dec. 25, 1894. This invention consists of a vertically rotating wheel, the lower periphery of which dips into a tank of water. Above the top of the wheel is a mechanism by which cans are delivered, so that as the wheel rotates a can will he received hetween clamps upon the periphery of the wheel, which press against the ends of the can. The end of the can having an opening, fits against the mechanism through which air is admitted under pressure into the can, and then if the can leaks in any way it will he shown hy hubbles escaping from it when it passes into the water tank. Two chutes are arranged near the tank, so that as the caus rise out of the water those which are perfect are delivered into one of the chutes, and those which show signs of leakage are delivered into the other to he repaired. The mechanism operates automatically, with the exception of the discharge of the defective cans, which may he effected hy the movement of a lever hy an operator.

TELLURIAN.—Cornelius G. Sullivan, Woodland, Cal. No. 531,399. Datod Dec. 25, 1894. The object of this invention is to provide a simple and inexpensive instrument for illustratiug the movement of the earth and moon ahout tho sun, the movement of the moon about the earth, solar and lunar eclipses, and, finally, to illustrate the cause of the tides in connection with what may he termed the "centrifugal theory." The tellurian consists of a primary hody; a suspeuding line, acting hy torsion to rotate said hody; a secondary body, and a connection between said secondary body and the primary body, whereby the former is caused to revolve ahout the latter by the rotation of said primary body. In the simplest form of the device the two bodies may he mere halls, the larger or primary body, representing the sun, being suspended hy means of a twisting string. A wire hracket connected with this larger hall suspends, hy means of another twisting string, a smaller or secondary hall representing the earth, and from this hall is supported, hy means of a wire arm, a satellite hody or hall representing the moon. The operator has only to hold or otherwise suspend the device from the main line, having first properly twisted hoth the suspending strings, and the proper motions are imparted hy tho torsion of said strings. These means for giving the movements simplify the instrument and make it possihle to economically construct it and supply it to all schools.

GLOVE.—Reuhen Raymond, San Francisco, Cal. No. 531,386. Dated Dec. 25, 1894. The main object in this glove is to avoid any seam in the crease or line of the ball of the thumb, thus making it seamless. Another object is to conform the thumh of the glove to the natural position of the thumb of the hand, hoth in front and back. The glove is constructed of a main portion fashioned to form the front, one side and the index and small fingers of the body of the glove, said portion having formed integral with the palm thereof the front of the thumh; a piece secured along one edge in the hack of the main portion of the glove, and which forms the hack of the second and third fingers; fourchettes forming the front and sides of said fingers, and an independent piece which forms the hack of the thumh, said piece having a point wbich is stitched to the hase of the hack of the index finger and to the adjoining side of the hack piece.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING DECEMBER 25, 1894.

531,495.—CARTRIDGE CRIMPER—T. R. Barney, S. F.
531,616.—CAN-TESTING MACHINE—Jos. Black, S. F.
531,588.—BRAKE—Dickinson & Warner, Tacoma, Wash.
531,372.—SHOULDER BRACE—W. M. Gamble, New Whatcom, Wash.
531,535.—HARVESTER—G. W. Ingersoll, Stocktou, Cal.
531,378.—GATE—J. E. Knapp, Brownsville, Ogn.
531,386.—GLOVE—R. Raymond, S. F.
531,571.—ANIMAL TRAP—V. J. Scherh, Pasadena, Cal.
531,399.—TELLURIAN—C. G. Sullivan, Woodland, Cal.
531,451.—CAN-HEAD DIE—N. Trayer, Astoria, Ogn.
531,580.—CINCH PLATE—A. P. Weeks, Santa Cruz, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent husiness for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

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THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Mello & Costa, in the Spring Valley mine, near Cherokee, Butte Co., to deposit tailings on flat ground; from H. E. Picket, in the Kentucky Flat mine, near Georgetown, El Dorado Co., to deposit tailings behind a dam in North Otter creek; from Wm. Johnson, in his mine near Volcano, Amador Co., to deposit tailings behind a dam in Clapboard gulch; from El Dorado Water and Deep Gravel Mining Co., in the Henrietta mine, near Placerville, El Dorado Co., to deposit tailings behind a dam in a dry ravine; from Leroy Hedge, in his mine near Brownsville, Yuba Co., to deposit tailings behind a dam in a ravine; from Rolland & Vanderburg, in the Epley mine, near Placerville, El Dorado Co., to deposit tailings behind a dam in a ravine; from the York Mining Co., in its mine near Brownsville, Yuba Co., to deposit tailings behind a dam in a ravine; from Hancock & Daly, in the Last Chance mine, near Placerville, El Dorado Co., to deposit tailings behind a dam in a ravine; from Goodman Bros. and Goodman & Bund, in their mines near Volcano, Amador Co., to deposit tailings behind a dam in Ashland creek; from Hadley & Bolles, in the 49 Flat mine, near Volcano, Amador Co., to impound tailings behind a dam in 49 gulch; and from G. A. Melnecke et al., in the Fine Gold mine, near Vallecita, Calaveras Co., to impound tailings behind dams in a dry ravine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Jan. 14, 1895, at 1:30 P. M.

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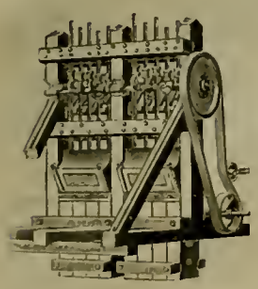

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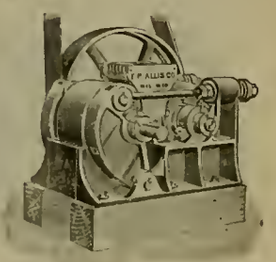

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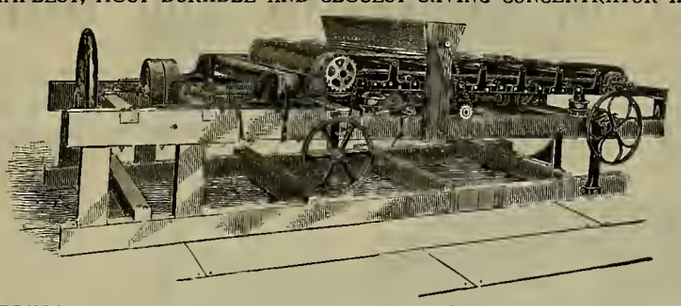

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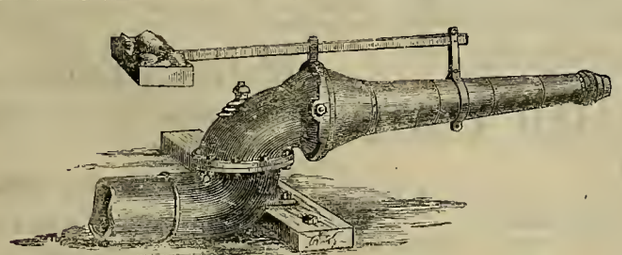

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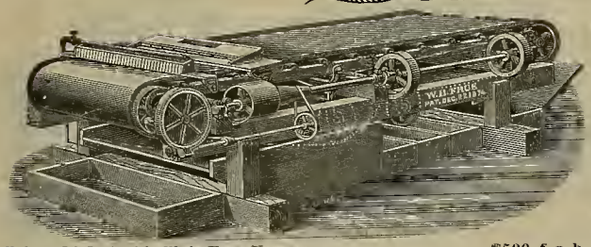

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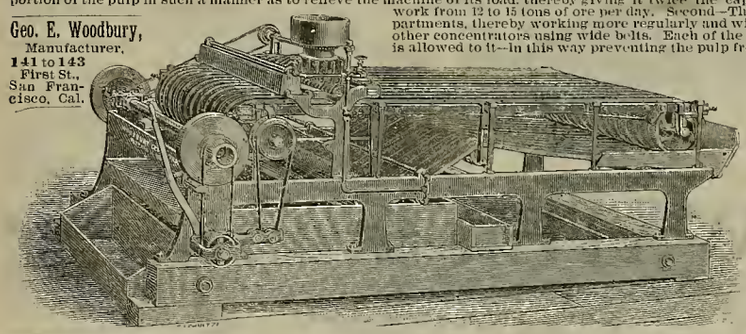

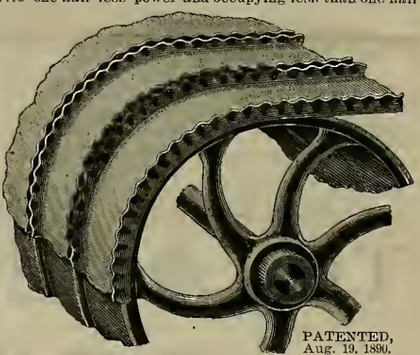

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This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1894.

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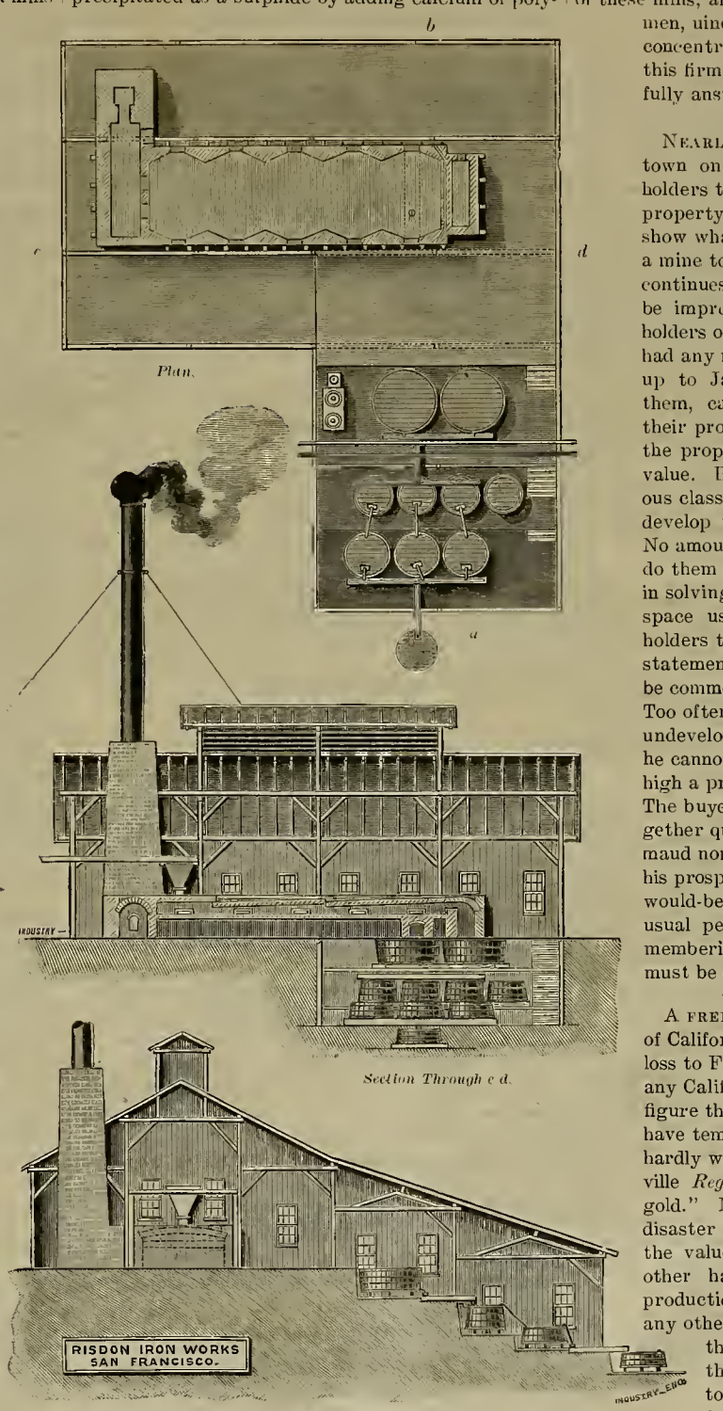
Chlorination Mill.

We illustrate this week one of the improved mills for working concentrates. It will be noticed that the roasting is done in a reverberatory furnace, as this style has proven the most satisfactory. We give a description of the mill and the process, as described by the manufacturers:

When concentrators or vanners are used in gold mills, their product is known as "concentrates" or "sulphurets." These contain the residue of the precious metals that has escaped amalgamation in the battery and on the "plates." The value of a ton of these concentrates is usually many times greater than the original value of a ton of the ore from which they have been extracted, and it is for the purpose of extracting this value from the concentrates that the chlorination mill is used. Assuming that the ore from which the concentrates came contained two and one-half per cent of sulphurets, then two and one-half tons would represent the product of a one hundred-ton mill; if five per cent, a fifty-ton mill, and if ten per cent, a twenty-five-ton mill. The cost of treating concentrates in these mills ranges from $8 to $15 per ton. Large gold mines frequently have their chlorination mill in connection with their stamp mill. The following description very clearly illustrates this process:

The ore treated is quartz, carrying free gold, pyrites, galena, chalcopyrite, arsenopyrite and zinc blende. It is first crushed in rock-breakers and then stamped fine enough to pass through a forty-mesh screen; then it passes as a slime over silver-plated copper amalgamating plates to the concentrators. The free gold is saved in the stamp batteries and on the plates; the sulphurets are collected by the concentrators. The latter are dried and then roasted, chlorinated and leached. The roasting is done in a reverberatory furnace. About one per cent of salt is added near the close of the operation. All the sulphur, arsenic and antimony are expelled, and the iron and other base metals oxidized. The gold is left in a free metallic state, the silver being partly concentrated into a chloride by the salt. The roasted ore is then transferred to chlorinating tanks, each holding from two to three tons. The covers are put on, and the joints calked with rags and luted with dough, to make the tank gas tight. The tanks have false bottoms, perforated with holes of suitable size and covered with sacking. Chlorine gas, made from salt, black oxide of manganese and sulphuric acid, is then introduced below the false bottom and allowed to permeate the ore. Two or three days are required for their permeation. The gold and silver is thus concentrated into chlorides. The chloride of gold is leached out by water added to the top, and drawn off at the bottom and run into precipitating tanks. The gold is precipitated in a fine metallic state by the addition of the sulphate of iron. The water is then run off, the gold collected and dried, melted in graphite crucibles and cast into bars. The silver chloride remaining in the ore is dissolved out by a solution of hyposulphite of calcium. The solution is run into other tanks, and the silver precipitated as a sulphide by adding calcium of polysulphide. The sulphide of silver is dried, roasted and then melted and cast into bars.



IMPROVED MILL FOR WORKING CONCENTRATES.

This mill can be built any size, the most common are of two and one-half tons and five tons capacity per day of twenty-four hours. This quantity is usually worked in three charges of about one or two tons, which require about eight hours' roasting. The Risdon Iron Works of this city have built a large number of these mills, and when in the hands of experienced men, ninety-five per cent of the value of the concentrates can be saved. Any inquiries to this firm for further particulars will be cheerfully answered.

NEARLY every paper published in a mining town on this coast advises mining claim holders that if they want to dispose of their property they must open it up, develop it, show what there is, or, rather, that there is a mine to buy. The advice is excellent, and continues to be repeated because it cannot be improved. Shiftless and unappreciative holders of mining "claims" which have never had any more work done on them than that up to Jan. 1st, '93, just sufficient to hold them, cannot expect to readily dispose of their property without first exhibiting that the property, if for sale, has some tangible value. But what shall be said of that numerous class who, holding "claims," would gladly develop them if they only had the money? No amount of well-meant advice, alone, will do them any good. Probably one way to aid in solving this matter would be to devote the space usually accorded to advising claim holders to develop their claims, to a plain statement of the fact that the price should be commensurate with their apparent merit. Too often the owner of a claim, developed or undeveloped, has his ideas set so high that he cannot find a market, because asking too high a price for his problematical property. The buyer and the claim owner can get together quicker where the latter does not demand nor expect an unreasonable price for his prospect. And, on the other hand, the would-be investor must needs recognize the usual percentage in favor of the game, remembering that risks, as well as profits, must be divided.

A FREEZE in Florida has boomed the price of California oranges. While regretting the loss to Florida, it is gratifying to know that any California product will command a good figure these dull times. But though oranges have temporarily increased in value, the fact hardly warrants the statement in the Oroville *Register* that oranges are "better than gold." No "freeze" in Florida or climatic disaster elsewhere would greatly enhance the value of the yellow metal, but, on the other hand, no overplus or competition in production can depreciate it. Not so with any other product. If oranges are "better than gold," it is of course possible that the orange growers will hesitate to exchange their product for an inferior commodity, and yet not wholly probable.

THE activity in mining so manifest in '94 is unabated. The interior papers are the best evidence of the pervading spirit, and in every direction are heard notes of preparation for work of development so soon as the weather permits. Old mines abandoned for years are to be reopened and worked under better economic conditions.

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J. F. HALLORAN.....General Manager

San Francisco, January 12, 1895.

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MISCELLANEOUS.—Concentrates; Personal; Obituary, 19. Improvements in Matte Smelting, 20-21. Governor Budd; An Interesting Reminiscence, 22. Mining Reports and Mine Salting, 23. Mr. Badlam Objects; Coal Importations, 24. Horseshoes of Cast Steel; Commercial Products Obtained from Sharks, 25. It Does, 26. Coast Industrial Notes, 27. A Titled Metallurgist; Deep Snow, 29.

UTAH capitalists, realizing the advantageous opportunities for investment in California mining properties, are investing heavily in Siskiyou and Trinity counties. The North Fork Co. has been doing considerable on Coffee creek, in getting ready for the coming season. The property consists of 300 acres of placer ground, and is unworked territory.

THE recent telephone patent decision in the United States Circuit Court at Boston attracts national attention. In effect all forms of telephone receivers and transmitters are free; the patent on the use of the induction coil with the transmitter expires this week, so that there is nothing in the way of installing and operating private lines that do not involve the use of a switch board.

IT'S a pity that silver cannot be taken out of the domain of petty partisanship and given the prompt affirmative action that the times require. Each party seems "sparring for points," and more desirous to avoid than press action. Politics should give way in crises to public requirements, and the silver question is to-day the most prominent factor in the nation's financial status.

COLORADO makes an excellent showing in mineral production in '94. The gold output of the State for the year is $11,235,000, an increase of nearly $4,000,000 over '93, making it surpassed as a gold producer only by California. When it is remembered that the total gold output of Colorado in 1891 was only $4,764,880, and of '92, $5,539,021, it will be seen what strides the Centennial Commonwealth has made. Colorado's papers claim that had it not been for the Cripple Creek miners' strike last summer the aggregate of the gold yield for '94 would exceed that of this State, and look forward with confidence to '95 in this regard. It is not a matter of much worry one way or the other, and meanwhile, California congratulates her sister State on her magnificent recuperation from the disaster that threatened her when there was no silver lining to the financial cloud, and will continue to lead in the output of the yellow metal. Colorado's silver yield for the past twelve months aggregates in value, even at present low prices, $14,721,751, and though lead he quoted at but three cents a pound, the aggregate yield that State shows for the year is valued at $3,268,613. The State makes a grand showing and its enterprising miners deserve commendation.

Two Shafts on Mines.

A State law which went into effect March 16, 1872, ordains that "it shall not he lawful for any corporation, association, owner, or owners of any quartz mining claims within the State of California, where such corporation, association, owner or owners employ twelve men daily, to sink down into such mine or mines any perpendicular shaft or incline beyoud a depth from the surface of three hundred feet, without providing a second mode of egress from such mine hy shaft or tunnel, to connect with the main shaft at a depth of not less than one huudred feet from the surface. It shall he the duty of each corporation, association, owner or owners of any quartz mine or mines in this State, where it becomes necessary to work such miues beyond the depth of three hundred feet, and where the number of men employed therein daily shall he twelve or more, to proceed to sink another shaft or construct a tunnel so as to connect with the main working shaft of such mine, as a mode of escape from underground accident or otherwise. Aud all corporations, associations, owner or owners of mines as aforesaid, working at a greater depth than three hundred feet, not having any other mode of egress than from the main shaft, shall proceed, as herein provided. When any corporation, association, owner or owners of any quartz mine in this State shall fail to provide for the proper egress as herein contemplated, and where any accideut shall occur, or any miner working therein shall he hurt or injured, and from such injury might have escaped if the secoud mode of egress had existed, such corporation, association, owner or owners of the mine where the injuries shall have occurred shall be liahle to the person injured in all damages that may accrue by reason thereof; and an action at law in a court of competent jurisdiction may he maintained against the owner or owners of such mine, which owners shall be jointly or severally liahle for such damages. And where death shall ensue from injuries received from any negligence ou the part of the owners thereof, by reason of their failure to comply with any of the provisions of this act, the heirs or relatives of the deceased may commence au action for the recovery of such damages as are provided hy an act entitled an act requiring compeusation for causing death by wrongful act, neglect or default, approved April twenty-sixth, eighteen hundred and sixty-two."

The Technical Society.

The first meeting of the Technical Society of the Pacific Coast for '95 was held at its rooms iu the Academy of Sciences on the 4th inst. The event of the eveuing was the reading of a paper entitled "Pressure and Impulse in Motive Engines—a Look into the Future," by Mr. John Richards, M. E. It was a thoughtful article of unusual merit, and the propositions, theories aud statements were hacked up hy lucid logic and practical argument. In the absence of Mr. Richards, the paper was read by Mr. Andrew M. Hunt. Mr. Arnold D'Erlach presented some interesting notes on the "Latest Project for an Alpine Tunnel at the Simplon," accompanied hy a map of the proposed route. The proposed tunnel would be over twelve miles in length, costing, it is estimated, 60,000,000 francs.

The Nominating Committee of the Society reported a ticket for officers for the ensuing year, to be voted for at the coming election.

The proposition to participate in the puhlication of proceedings in the *Journal of Associated Sciences* was unanimously endorsed, and the directors empowered to take prompt affirmative action. The scheme to unite with the Mechanics' Institute is yet under discussion.

THERE have heen nearly a thousand devices patented for preventiug the ravages of the teredo navalis and the limnoria, hut none are wholly effective. A fortuue awaits the man who can successfully deal with those pests, which cost this coast alone nearly half a million dollars annually.

THAT "biggest gold miue" in New York, spoken of last week, is still heing worked. It is probahle another hig strike of ore 900 fine will he made about February 1st.

Tardy but Beneficent.

The last and greatest of the late Jas. Lick's puhlic henefactions is at length put into practical shape, and the purposes of the deceased philauthropist are in a fair way to he realized. The Lick Ohservatory, the California Pioneer Buildiug, the Academy of Sciences, the Key Monument, the free haths and minor henefactions have now added to their numher the California School of Mechanical Arts which was formally transferred to the school trustees on the 3rd inst. It cost $115,000, and the remainder, $430,000, has heen transferred to the credit of the school trust.

The building will accommodate 350 hoys aud girls, and is considered hy many to be Mr. Lick's best gift. Mr. A. S. Hallidie, vice-presideut of the school trustees, in an address ou the school, its province and purpose, said the founder's desire was recognized; that the school should graduate good artisans rather than professional men and women, aud that its benefits should apply to those whose expectations are to become first-class journeymen rather than superintendents, managers or foremen. It is intended that this school shall be a means to develop the hest obtainable results, and iu this the intent is to be practical, taking a middle position between the trade school and the manual training school, with effort to combine the best elements of hoth and trusting to experience for such change or modification as time may suggest.

The work is uecessarily experimental in some ways. The scope of instruction cannot practically induce all desirable elemeuts, but the intent is well shown in the following statement from Mr. Hallidie's address:

> The California School of Mechanical Arts will carry students to the point where they may be considered as well fitted to become first-class artisans. The groundwork of three years in general instruction, allied to mechanical pursuits, in which is included the usual education of an American boy or girl, and which will complement that of the common school, and the one year of special trade instructiou under practical teachers expert in that particular trade, will give an advantage to the graduate which will be difficult for others to overcome.
>
> While admitting that excellent workmen were produced under the old apprenticeship system, it was at an enormous economical sacrifice, and oftentimes at the expense of much personal self-respect. The time of a boy or girl indentured to learn a trade was considered the property of the master, and was often valued for its servitude, and not as an element of value to the apprentice, and the amount of drudgery performed under such conditions was appalling to an ambitious and independent mind. This school proposes to economize the time of the student and to give him such opportunities for advancement that it will be the fault of the student if he fails in making a fair amount of progress.

It may not he wholly out of place to suggest that, granting the fullest success to the practical intent of this admirable institution, it were a pity after such elaborate preparation and the arousiug of hopes and honorahle amhition in the mind of a student if trade conditions did not give a fair opportunity for their realization. The idea is a grand one. Thousands go yearly out of our public schools with their heads crammed and their hands empty, poorly fitted for the battle of life. This school proposes to give a young Californian a chance to learu a trade; to put something in the hands and the head that will be of life-long value if utilized, and the practical purport is to he warmly commended. With the commendation comes the reflection: What are the inducements in San Francisco to-day for amhitious youth to learn trades? What the prospect of remunerative employment when the deserving possessor of a trade is ready for such employment? There is no obligation, actual, tacit, or implied to furnish such employment, and yet the acceptauce and establishmeut of such a school carries with it an indirect assumption that results in actual life will justify and warraut the noblest effort on the part of the studeut therein.

The working results of the great industrial school, which begins under such favorahle auspices, will, of course, not be confined to this city, nor probahly to this State; the widening circles of intelligent lahor will he benefited to remote limits, but its greatest resultant good to the metropolis is bound up with the question of the progress of manufacturing industries in that city.

A NEVADA EXCHANGE says that in the viciuity of its publication office several claims were "jumped" after New Years. Auy oue holding a claim, who didn't think it worth while to have notice recorded as required hy that relief hill known as "the suspension of assessments," ought to have his claim jumped.

Concentrates.

OREGON PAPERS say that State will produce $3,000,000 in gold this year.

THE Davis estate has sold the Pacific mine, Montana, to Silas F. King for $90,000.

"NOT since '62 has there been such heavy and contiauous rain," writes a Tuolumne Co. subscriber.

WHILE digging a well a Helena, Montana, man got enough gold out of the dirt to almost pay for the well.

SALT LAKE is to have a mining stock exchange. Jos. Davis is now in this city getting points on how to run it.

THE Mohave Co., Arizona, *Miner* deserves credit for energy and faithful work in its field, which it completely covers.

H. MATTERN and G. E. Sackett, of Ashland, Or., have received a draft for ore shipped to the Selby Smelting Works. The rock went $240 per ton.

DURING the past year the Boston & Montana company has been employing nearly 550 men in Butte and producing from 15,000 to 18,000 tons of ore per month.

AT a meeting of the stockholders of the Anaconda Company, held in Butte Dec. 31st, the life of that corporation was extended to forty years from Jan. 19, 1891.

THE bill recently introduced by Congressman Caminetti regarding mineral lands will be amended to make its provisions include all the railroad grants in the State.

THE Truckee *Republican* reports a snowfall for the season at that point to Jan. 5th of 178.5 inches. In 1890, which was a year of excessive snow, the fall to the same date was 184.75.

HOT SLAG from lead blast furnaces is being used at the works of the Broken Hill Proprietary Company in New South Wales, Australia, to generate steam to run an electric plant.

THE case of M. W. Fox against the Hale & Norcross Mining Company, which involves a judgment for more than $1,000,000, will be called up in the State Supreme Court for reargument on the 21st instant.

THE Pacific Bureau of Mines Association of Portland, Or., has incorporated with a capital stock of $100,000, divided into shares of $1 each. W. T. Mendenhall, W. J. Lehigh, E. S. McComas and R. Glen are the incorporators.

THE MacArthur-Forrest people, through their representative, P. Geo. Gow, have made an offer to put up a cyanide plant in Bodie for crushing and working low-grade ores, they requiring a guarantee of a certain amount of rock.

THE *Central Nevadan* says a lot of giant powder was placed in the blacksmith shop at the Morning Star mine to thaw out. It exploded and blew the building to pieces. The report was heard at Battle Mountain, a distance of sixteen miles.

MESSRS. HAMPTON AND LEWIS cleaned up recently $27,000 from their mine situated on Tom East creek, Josephine Co., Or. Such a sum would not be had work for the year, but more than double that amount will be realized at the end of the season.

THE Good Hope Placer Mining Company, with a capital stock of $100,000, proposes to work the Good Hope placer, the Little John placer and the Mitz placer claims, containing eighty acres in White Canyon mining district, along the Colorado river.

Legh Harnett, the mining expert and writer who has been making a personal inspection of the Josephine county, Or., mines, gives it as his opinion that this coming season will see no less than sixty hydraulic placers at work in that county, large and small.

THE Premier of the colony of Western Australia stated in his Budget speech on September 24th: "The export of gold for 1890 was £80,664; 1891, £115,182; 1892, £226,284; 1893, £421,212; for the half of 1894, £288,281; and up to the 22d of last month, £496,975."

HENRY BRATNOBER, the well-known Montana mining man, is investigating the reported rich gold discoveries in the Coolgardie district, in Australia. In a letter to a Montana friend he says he is not favorably impressed with the mineral possibilities of that country.

THE Parrott Company will remove its smelting plant from Butte, Montana, to a point about fourteen miles from Whitehall, in Jefferson county, known as Point-of-Rocks. The company has secured 7000 acres of land there, and the water is sufficient for the purposes.

NEW YEAR'S DAY seventy-five members of the Miners' Union marched to the King Solomon mine, near Clancy, Montana, in a body, and induced four non-union men employed in the mine to quit work. Three of the men joined the union, and the other refused and left the camp.

THE La Noria silver mine in Mexico, in which Pennsylvania men have sunk $500,000 in cash, has been abandoned by the stockholders. It has been decided to sell the entire property at public sale in Pittsburg within thirty days to the highest bidder to pay off the indebtedness.

A. H. RICKETTS, chairman of the Committee on the Protection of Mineral Lands, yesterday sent to Washington a report which will be made amendatory to the Caminetti bill, showing in the aggregate, an additional 20,585,000 acres included to sundry land grants to railroads in California.

THE *Mining and Market Reporter* says that there is no mining State in the Union that has been more obnoxiously infested with the "wild cat" mining speculator and "wild kitten" mining man than Montana, and evinces a disposition to strangle the beasts.

THE old Keystone mill at Amador City was partially destroyed by fire last week, which will cause a delay of several weeks until it can be put in running order again. Although the building was not entirely destroyed, yet the damage done to the works will amount to several thousand dollars.

THE old, old question of apex and dip comes up again in a suit in Salt Lake City of Messrs. Denhalter and Hoffman vs. the Galena Consolidated Mining Company. The plaintiffs are the owners of a half interest in mining claims adjoining the Galena property, and claim $200,000 as their share of the proceeds of ore extracted from their claims by the Galena company from 1888 to 1890. The defense is that the vein from which the ore was taken has its apex in the Galena claim and that the plaintiffs have no interest in it.

THE Black Wonder Mine Co., of Sherman, Colorado, claims to have "just paid dividend No. 9," but those acquainted with the company and its methods say that the Black Wonder mine is not a dividend payer, and the payment of dividends is fraudulent and done to deceive innocent and prospective investors.

THE Alaska company at Pike City, Sierra Co., is running a drain tunnel in from the mill, which will tap the shaft they are working through, at the 150-foot level, just below where the most water comes in. They will use the tunnel to drain the mine and to run the rock directly into the mill, saving power and time.

"KEEP your eye on the mineral land bill," says the Anaconda *Standard*. The theory is nothing good can come out of the Fifty-third Congress, yet it is barely possible that, out of the wreck, the people of Montana may save a little something in the way of the rescue of the State's mineral domain from the Northern Pacific ring.

THE Mayflower Mining Company has served notice on the owners of buildings in Bath that from the 1st inst. $2 per month rent will be payable at the office of the company. The town is just east of Forest Hill, and was built at the works of the Breece & Wheeler gravel mine, at the surface line between the Mayflower and the Breece & Wheeler mines.

HAS the Idaho mine inspector been able to protect a single miner in the lower levels? asks the Cœur d'Alene *Sun*. If the office is continued, the coroner's jury in each and every instance of a mine accident from a cave-in ought to bring in a verdict of manslaughter against him for negligence of duty.

GEORGE GATES, proprietor of the sulphurets-saving plant at the Kennedy, Nev., is preparing to make another test of the cyanide process in the treatment of his sulphurets saved from the tailings. He gave the process a trial nearly two years ago, but the result was not satisfactory in the percentage of gold extracted.

THE *Tribune* publishes an elaborate review of the mining interests in Utah for 1894. Figured at local prices the output of lead, copper, gold and silver shows a total of nearly six and a half million dollars. Computing all the metals at their seaboard value it would increase the total to over eleven and a half million dollars.

REPORTS come to the Tombstone, Arizona, *Epitaph* from Plomosa of great finds in the placers. Lately two miners took out $117 in one pan. The Wilson Brothers have taken out $1 to the pan right along. There are 200 men in the district, and they are all doing well. Plomosa embraces about all the country between Ehrenburg and Harqua Hala.

J. B. WILSON, a Kaslo, B. C., merchant, who sent 4 oz. 3 gr. of local gold to the San Francisco Mint a short time since, has received returns. The gold went .837½ fine, with .153½ silver. The gross value of the metal was $68.20, and net value $66.95. This places the purchase value of Kaslo gold at about $17 an ounce. Some Big Bend gold is worth $18.50 an ounce in San Francisco.

AT a recent meeting of the Golden Feather Channel Co., Ltd., in London, Eng., it was announced that operations in the Feather river near Oroville were on the eve of a great success, and that it was expected rich returns would result from next summer's work. It was decided to reorganize the company under the name of the "Golden Feather, Limited," and an assessment authorized of one shilling per share.

THE Hailey, Idaho, *Times* says: The stamps of the Camas No. 2 mill were started up last Saturday. After running a few hours the plates began to show gold, and last night, after thirty-six hours' run, they were thickly coated. The other ten stamps are about ready, and will begin dropping some time this week. Until they do, miners say that the mill will make three to four tons of concentrates per day, worth between $70 and $90 per ton. This, besides what free gold will be caught on the plates.

THREE Utah doctors have organized the California Gold Mining and Milling Co.—Dr. Vincent, Dr. Dart, Dr. Bowers—and propose to work sulphide ores in Meadow Lake district, seven miles from Cisco. Five claims are owned, on one of which a tunnel penetrating 150 feet has uncovered a body of ore ten and a half feet thick, which varies in assay from $20 to $300 per ton. The district was famous many years ago. The M. D.'s may succeed in bringing the rebellious ores to subjection.

THE Siskiyou Gold Development Co. of Salt Lake City, Utah, has organized with a capital stock of $1,000,000. The incorporation consists of W. S. McCornick, president; A. Hanauer Jr., vice-president; John R. Middlemiss, secretary; James Glendenning, and D. P. Tarpey—these constituting the board of directors. The company has paid $50,000 for what is known as the "Porphyry Dyke," situated on the west side of the Klamath river, about five miles from Hornbrook, and will soon erect a large plant, a 100-stamp mill, it is reported.

THE McCauley G. M. & M. Co., of Gardiner, Montana, is putting in a twenty-stamp gold mill. The stamps weigh 850 pounds. The mortars are lined with copper to amalgamate as much gold as possible before the pulp passes through the screens. After being crushed at about forty mesh, the pulp flows over amalgamated copper plates in front of each mortar, then into a series of classifying boxes, and from these the different sizes are drawn off into a double deck round huddle of special construction, when the final concentration of the sulphurets is effected.

IN the two suits instituted in this city in 1891 by Theodore Fox, a stockholder in the Consolidated California & Virginia Mining Company, who charged J. W. Mackay, Senator Jones and other directors of the California & Virginia Mining Company with fraud in the management of the California & Virginia property, Judge Seawell has sustained the demurrers entered by defendants as to all but one point, thus throwing out of court all the charges save the one that Mackay, Jones, Flood and others, as managers of the California & Virginia mine, sent the ore from the mine to the works of the Comstock Mill & Mining Company, which they owned, to be crushed and milled at an exorbitant rate. A further hearing on this point will be had.

THE Butte *Independent* says there is a remarkable young woman who resides in Lump Gulch, who certainly made a great record for herself. She is very strong and energetic. During the last few months she has helped sink a twenty-three-foot shaft upon a very promising claim in which she and another party are interested. She did all the shoveling connected with the work. In addition to this the enterprising young woman has sawed 100 cords of wood, kept boarders and assisted in various other enterprises. The young men will be glad to know this prodigy is unmarried.

H. T. STRATTON writes from Alaska that the gold field there is probably larger and richer than any now being worked in the world, but there are many drawbacks in climate, the high price of provisions, lack of transportation, and that only a stalwart man physically can endure the strain. He says: "This is no country for weak lungs. Not a man in twenty will endure the hardships for one season for any sum of money he is likely to make in ten. I can hardly think of a man of my acquaintance that I would advise coming. No one but a thoroughly seasoned prospector and camp-man has any business here at all."

THE excavation for the underground hoist at the Roanoke mine near Mokelumne Hill, Calaveras Co., is done and the plant in position and ready for work. The excavation is 7x30 feet in the clear, timbered by eight-inch spruce timbers and lagged with two-inch lumber. A force of men was put to work on the top sinking; another force worked up from the excavation. They met about the middle with a variation of less than half an inch. The shaft from the hoisting plant is down to a depth of fifty-five feet, and the rock is very rich. This underground water-power hoist is a novelty, the only thing of the kind in the county. Without it water power could not be used at the Roanoke mine.

AN outgrowth of the sale of the Mountain Lion and the Ohio mining claims in Siskiyou county last November by Thomas Morcom, a citizen of this State, to H. W. Brown and some of the Mercur, Utah, stockholders, for $50,000, is a quarrel over a portion of the purchase money. Andrew Rahbitt, who claims to be entitled to one-third of the net proceeds of the sale, says that Morcom is endeavoring to defraud him out of a portion of his share. A part of the purchase price was paid at the time the mines were bought, and of this Babbitt says he received his proportion. A note for the balance due, payable on May 14, 1895, was given by Brown, and on this $7000 was subsequently paid. About a week ago the note, on which $10,500 was yet unpaid, was discounted at the bank of McCornick & Co., in Salt Lake, for $8000, through Louis Green, acting as attorney-in-fact for Morcom. Being apprehensive that he is not to be paid $2300, which he claims is yet due him on the deal, Babbitt filed an attachment suit against Morcom. A writ was issued and a levy made by the sheriff on cash supposed to be the money paid by the bank on the Brown note.

State Constitutional Amendment.

TO THE EDITOR:—Regarding the query "How will the amendment of Section 17 of Article 1 of the State Constitution, which reads as follows: 'Foreigners of the white race, or of African descent, eligible to become citizens of the United States under the naturalization laws thereof, while *bona fide* residents of this State, shall have the same rights in respect to the acquisition, possession, enjoyment, transmission and inheritance of all property other than real estate, as native-born citizens; provided, that such aliens owning real estate at the time of the adoption of this amendment may remain such owners; provided, further, that the Legislature may by statute provide for the disposition of real estate which shall hereafter be acquired by such aliens by descent or devise;' affect alien ownerships of California gold mines," I will say that in my opinion the effect of the recent amendment in so far as it touches this question will be to restore the common law disability as to real estate acquired after its adoption by aliens who are *bona fide* residents within this State; and that non-resident aliens rest under no other or greater disability now than before said amendment was adopted, unless Section 671 of the Civil Code of California (which took effect July 1, 1874) and which provides that "Any person, whether citizen or alien, may take, hold, and dispose of property, real or personal, within this State" be unconstitutional, which I do not think is the case, as the Legislature does not seem to be disahled from extending or adding other rights on non-resident foreigners by the amendment under discussion.

Yours faithfully, ALFRED HERBERT RICKETTS,
Attorney and Counselor at Law.

San Francisco, January 10, 1895.

Personal.

MR. A. E. ROBERTS has returned from a visit to the South African gold fields.

M. BUCKLEY succeeds Geo. F. Kellogg as superintendent of the Hope mine at Basin, Montana.

J. V. KEELEY, owner of the Clementina mine, Yellow Pine district, Lincoln Co., Nev., is in the city.

C. A. LILLY, foreman of the California mine in Eureka district for a long time, has been appointed superintendent of the Eagle Bird mine at Ormonde, Nevada Co.

Obituary.

JONAS H. WALKER, formerly associated with Mackay, Fair, Flood and O'Brien in the Comstock deal, died in poverty in this city on the 3d inst. Walker accumulated millions and went to Philadelphia in 1872. He lived luxuriously and entertained lavishly. His millions were lost in unfortunate speculations in railroads and stocks. He tried to retrieve his fortunes in this city, but luck was against him, and a few days after his former colleague, Jas. G. Fair, left this earth and $30,000,000, he passed away with not the slightest likelihood of there being any litigation over his estate.

Improvements in Matte Smelting.

Written for the MINING AND SCIENTIFIC PRESS by HERBERT LANG, Seattle, Wash.

The essential condition of pyritic smelting is the maintenance of an atmosphere in the blast furnace oxidizing not only toward carbon, the customary fuel, but toward certain ores as well. In other words, there must be an excess of oxygen above the amount necessary to burn the coke or charcoal, to react upon the oxidizable parts of the ore charge. Thus, pyritic smelting burns ore as well as carbon, and produces at one operation the effects which are usually gained by the two separate ones of roastiug and smeltiug. The substances which serve the purposes of pyritic smelting are the oxidizable minerals, or such as are commonly roasted iu other processes, belonging to the classes of sulphides, arsenides and antimonides, embracing pyrite, pyrrhotite, chalcopyrite, blende, mispickel, and very probably galena. To these may be added, in due course of experience, the remaining native minerals of these classes. We may make use of any substance which, by melting down, produces matte or speiss. These, be it noticed, are the substances which have been regarded as conferring upon ores their refractory quality; whence we may say of pyritic smelting that it consists in burning the refractory and heretofore difficult elements of ore, it being practically found that the most injurious combinations, when viewed from the standpoint of other processes, are the most docile to pyritic smelting. I would not be understood as claiming for this new art anything which does not rest upon intelligent experiment, and therefore I will limit the above assertion as to the availability of the process in treating refractory ores to just those combinations which have been the subject of experiment, namely, to pyrites and, to a less degree, those ores containing blende and chalcopyrite.

NATURE OF THE OXIDIZING FUSION.

Every one understands the ordinary carbon reduction smelting (smelting by carbon reactions) and the function of fuel as producing heat, but there are results of the fusion which are not generally understood. Let it be borne in mind that no volatilization of sulphur or arsenic, nor any oxidation of iron or other metal is to be expected when we fuse with carbon alone. If we melt down any of the long list of sulphides, arsenides, etc., which, for convenience, I call the matte formers, we will get an amount of matte almost equal to the original material charged, and consequently there can have been no concentration of the values in a smaller mass: that is to say, no enrichment of the product. We have, therefore, gained little or nothing by the operation, when carried out with a charge largely composed of matte formers, excepting those advantages which are incident to all forms of smelting alike, namely, the slaggiug of the earthy substances and the volatilization of the first sulphur equivalent in pyrite. This, the reducing fusion for matte, when it is applied to the extraction of gold, silver and copper from their ores, is generally known as plain matting, and by some, including the writer, is styled the German system of matte smelting. It is always carried out in blast furnaces. As far as the present inquiry is concerned, the significant feature of the German system is the reduction of metallic oxides and the preservation of sulphur and arsenic combined with the heavy metals as matte. Furthermore, the same mixtures which in the presence of those elements give rise to mattes, in their absence produce metals or metallic alloys. Later I will show how the pyritic processes produce opposite effects; how they produce metallic oxides, eliminate sulphur and arsenic, and how the conditions are adverse to the production of metals or alloys. We may say that the efficacy of the German system of smelting by carbon reactions decreases as the proportion of matte formers increases, while that of the pyritic system increases with the increase of the matte formers. We have degrees of pyritic smelting, varying in intensity from the slight pyritic effects noticed in copper matte furnaces, where a small percentage of sulphur is volatilized and by inference a corresponding amount of oxides formed and scorified, up to the powerful effects of the hot-blast acting upon solid masses of sulphides, and consuming them as coal is consumed under the forced draft of a man-of-war.

There are two divisions of pyritic smelting which, for convenience, may be called the Austin process and the gradual reduction process. The former is characterized by the sudden combustion or fusion of the components of the charge, the latter by their gradual heating, and the oxidation and subsequent fusion of the matte formers. In the latter the furnace is fed in the ordinary way, the compounds being added in layers alternating with the fuel, while in the former special arrangements are made by which the combustible ores are fed directly into the zone of fusion, which they reach in a cold state, with their fuel value unimpaired, which ought to be a valuable characteristic. Advantageous as this proceedure would seem to be from analogy, experience does not bear out theory, and the device which accomplishes the central feeding has been abandoned in favor of layer feeding, which is now in vogue at various existing plants. We need, therefore, not discuss further this peculiar practice, which would seem to have sunk into disuse, but will proceed to a consideration of the gradual reduction process.

Under ideal conditions prevailing in the pyritic furnace the following train of effects is produced: The ideal charge, consisting of matte formers, together with just sufficient silica to slag the oxides expected to be formed, is fed in layers upon the cold top of the preceding charge. I say cold top, for from a hot top we infer (*a*) a serious loss of heat; (*b*) a loss of metal by volatilization, intolerable in any process. As the charge sinks in the shaft, it rises in temperature by the absorption of heat from the ascending gases, until a point is reached where the gases, oxidizing of course in the ideal, begin to react upon the matte formers—that is to say, they begin to roast them, convertiug sulphur into sulphur dioxide, arseuic into arsenious acid, and the heavy metals iuto oxides. A second source of heat, namely, that resulting from local chemical action, is now added to the first named source, and the reactions ensue with increased energy. We may infer a gradually increased intensity of chemical action from the moment the charge is fed into the furnace, or from where it reaches a perceptibly heated location iu the shaft until it becomes fused and its components separated in the fusing zone. We may also iufer a production of matte at a considerable elevation in the shaft, certainly much above the locality customarily called the zone of fusion. And we must infer the very extensive combustion of the matte as it trickles downward through the partially melted charge, all the time in contact with gases which carry an excess of oxygen.

Of moisture and carbonic dioxide the elimination is complete. Sulphur is eliminated as sulphur dioxide, and to some extent as sulphuric acid. Sulphur which escapes oxidation goes to form matte. Arsenic is volatilized as arsenious acid more freely than sulphur, but a portion remains as speiss. Antimony we may allowably conjecture to behave as arsenic; but in the absence of experimeutal observation we may dismiss the matter at present. Sesquioxides of iron and manganese are reduced to protoxides, presumably through the influence of the molten matte, upon which they have a decided reaction which may be typified thus: $Fe_2O_3 + M_2S = 2FeO + M_2 + SO_2$.

These as well as other metallic oxides, those formed in the furnace as well as those naturally occurring in the ore, are scorified by the silica of the charge and added to the slag. I present herewith a tabulated resume of the changes which occur to the substances which constitute the usual smeltiug mixtures, premising that the general accuracy of the statements embraced within it depend upon the degree of oxidation taking place at the particular moment, which must neither exceed nor fall short of the requirements of commercially successful work; which is to say that only enough sulphides, etc., must be left unburned to furnish matte for a good extraction of the valuable metals contained in the mixture. When copper is worked for the proportion of sulphur required to form the matte is necessarily large, the matte itself generally reaching twice and often thrice the weight of the copper. But in precious metal smelting, and when the copper and lead are present if at all only in small proportions, the matte is, or rather should be, formed in much smaller amounts. Even as small a proportion as one-fortieth of the charge did good service experimentally at Mineral, while five per cent or one-tweutieth was regularly made whenever the ore admitted of so high a concentration. I am not aware that in treating heavily sulphureted ores so high a coucentratiou has ever been effected, but I do not consider pyritic work satisfactory that fails in puttiug at least ten tons into one, when dealing with ores that carry less than five per cent of copper. With ores practically free from copper, such, for example, as the gold-bearing concentrates from the California mines, I see no reason why a conceutration of twenty iuto one would uot be practicable, although the use of such material would of course involve brickiug as a preparation for smelting, and very probably the addition of copper ore to a small extent to secure a complete extraction of the gold. I gather from experience and observation that the matte, to effect a reasonably complete saviug of the gold and silver, should have at least twenty or twenty-five per ceut of copper; but with more acid slags than I have used I am informed that none is necessary. I conclude, from data furnished by others, that too high a percentage of this metal acts prejudicially upon the silver extraction.

EFFECTS OF THE OXIDATION OF SULPHIDES.

It is worth while for the sake of clearness to go over the ground a little more fully as to the functions of sulphide ores and matte formers generally in the pyritic furnace. These functions are three. First, we get heat by their combustion, which assists the reactions and helps do the smelting; second, we get flux out of them to take up the silica; and third, what is left of them melts down as matte and saves the valuable metals in the whole charge. Notice how intimately the three functions are connected, and how they are related. The heat produced accords with the amount of ore (sulphides, etc.) burned, and so does the amount of flux produced. The more heat, the more flux; but the more combustion of ore, the less production of matte. Consequently, the greater production of heat and flux from this source, the less matte we get. Again, as the elimination of valueless matters is the object of smelting, the less matte we get, as long as it is sufficient in quantity to absorb the metals that we seek, the better it is for us. Therefore, a highly concentrated matte is always to be sought, and our operations are successful in proportion to the concentration of the materials.

The questions that now arise are: How much available heat does the burning of the ore give? How much flux and of what sort is produced? And how much matte is ordinarily left? The experience thus far had in pyritic work does not supply entirely satisfactory answers to these queries, but we can approach reasonably close to satisfactory answers if assisted in some cases by reasonable conjecture. It was for a long time maintained by Mr. Austin, the real inventor of pyritic smelting, that enough heat is given out by the internal combustion of a fairly favorable charge to smelt it. It is, in fact, claimed that, with a highly heated blast (the indispensable adjunct of the extreme degrees of pyriticism), charges were smelted and the furnace continuously run without inside fuel excepting the combustible parts of the ore itself. But this achievement, while prodigiously gratifying to metallurgists and in every way commendable and praiseworthy, has not proved thus far the forerunner of recognized practice, and there appears to be no locality where the pyritic work is carried on in that manner. The result of the vast deal of experimenting and practical smelting which has been done within five years in pyritic furnaces is not to smelt without fuel, but to smelt with a smaller

COMPARISON OF SMELTING EFFECTS.

SUBSTANCE.	GERMAN SYSTEM.	PYRITIC SYSTEM.
Quartz	Scorified.	As in German system.
Alumina and its compounds	Scorified.	As in German system.
Limestone	CO_2 volat. CaO scorified.	As in German system. As in German system.
Magnesian Limestone	CO_2 volat. CaO, MgO scorified.	As in German system. As in German system.
Lime, Magnesia, Baryta and their silicates	Scorified.	As in German system.
Heavy Spar	SO_2 (SO_3 ?) volat. BaO scorified. BaS enters matte.	SO_3 volat. (conjectural). BaO scorified. $BaSO_4$ fused, eliminated with basic slag.
Iron Pyrites (Pyrite) (Pyrrhotite)	S, volat. FeS matted.	SO_2, SO_3 volat. FeS matted. FeO scorified.
Iron-Copper Sulphides (Bornite) (Chalcopyrite)	(Cu Fe)S formed and matted.	(Cu Fe) S matted. FeO scorified.
Copper Carbonates and Oxides	Copper enters matte as Cu_2S.	As in German system.
GOLD *in any form*	Enters matte as sulphide (?); recovery complete.	As in German system. Recovery complete.
SILVER *in any form*	Enters matte as sulphide.	As in German system. Recovery probably decreases as pyritic effects increase in intensity.
ZINC BLENDE	Part enters matte. Part decomposed— ZnO enters slag Zn volatilized. S volatilized.	Largely decomposed. Zno scorified, part volatilized. SO_2, SO_3 volatilized.
GALENA	Enters matte as PbS or Pb_2S; recovery of lead complete.	Mainly decomposed. PbO scorified. SO_2, SO_3 volat. Recovery of lead incomplete.
ARSENIDES and SULPH-ARSENIDES (Mispickel, Lollingite, Leucopyrite, etc.)	Arsenic slightly volatilized; remainder fuses with metals of group 4, as arsenide matte (speiss).	Arsenic chiefly volatilized. Iron oxidized and scorified.
COBALT and NICKEL	Enters matte to the exclusion of iron, but are excluded by copper. In presence of arsenic enter speiss. Recovery complete.	As in German system.
METALLIC IRON	Taken up by sulphur, forming matte. Scorification trifling.	Oxidation complete. Scorification of resulting FeO. Smelting temperature produced, and process assisted.
LEAD, *as Oxides and Carbonates*	Matted as sulphide. Recovery perfect.	Mainly scorified. Part may enter matte. Recovery imperfect.
MATTE (Fe Cu, Ag, Pb, Co, Ni), (As, S)	Fuses unchanged.	Part oxidized. Separation of As as As_2O_3; S as SO_2; Fe as FeO; Pb as PbO; fusion of remainder as (Cu, Co, Ni, Au, Ag) S. Oxidation (and concentration of matte) proportional to intensity of pyritic effects. Losses of lead and silver probably dependent on composition of resulting second matte.
COKE CHARCOAL	Incomplete combustion. Products CO, CO_2 in various proportions.	Complete combustion. Product CO_2.
COAL	Distillation of volatile constituents. Incomplete combustion of fixed carbon. Calorific effect limited.	Combustion probably complete, and calorific effects satisfactory (conjectural).
WOOD	Distillation excessive. Very slight smelting effects.	Combustion tolerably complete. Temperature may be sufficient for smelting, especially if aided by the hot blast.

proportion of carbonaceous fuel than any other smelting process has ever used or can use. This is not to say that all plants which claim to run on this system really so smelt, for I have information to the effect that at least one of the Colorado pyritic plants uses fourteen per cent of fuel; but this is not pyritic smelting, nor is it possible with such extravagance of fuel to achieve any desirable pyritic effects. With better management, the use of four or five per cent of coke, supplemented by the warm blast, has proved sufficient to fuse charges of ordinary difficulty, containing ten to twenty per cent of sulphur combined with iron and copper, producing a low-grade matte. The work in the Austin furnaces has been directed toward the beneficiation of heavy pyritous ores, high in sulphur, with the result of showing that such ores may be more profitably treated by pyriticism than by the rival process of lead smelting. But it also appears that the original plans of work, namely, the practice of central feeding of the sulphides to obviate sticking to the walls, and perhaps other devices recommended by the inventor, have not been found advantageous and have been discarded. The heated blast, which at first was held as of prime importance in pyritic work, appears to have fallen from its high estate in Colorado, and I hear now of furnace managers who condemn its use entirely. But in this I think they are entirely in error. Time, I think, will show that the greatest error of those who have exploited the Austin process is the practice of swift running. A great deal has been said about the daily capacity of pyritic furnaces and about the consequent saving of time and labor. Now, the essential thing is not to crowd a great lot of material through a furnace, but to do good work on what you have. Pyritic work of a thorough kind is inconsistent with fast running. Pyritic work is essentially slow. The claims of inventors that the use of smaller furnaces saves labor is the veriest bosh, inasmuch as it costs exactly as much to feed ore into and take slag away from a small furnace as it does from a large one; and the cost of a large furnace is but a mere trifle above that of a small one—a sum so small as to cut no figure in the cost of a plant. As regards the concentration of product by the one and the other, a small furnace—say of fifteen square feet hearth area—may be driven to smelt seventy-five tons of heavy sulphides per day, but the greatest probable concentration of product in such a case would not be above five into one. Now, if by using a furnace twice as large and driving half as fast we get a concentration of ten into one on the same amount of ore smelted, who can for a moment deny the economic superiority of the slower rate of running, especially as this would be achieved at merely the extra expense of furnace construction, say of $200 or $300?

The results obtained by myself at Mineral, Idaho, in smelting charges of argentiferous (and slightly cupriferous) sulphides, bear out in full the assertion that slow running is essential in pyritic work. The ore carried as high, at times, as twenty per cent of sulphur, always produced very fusible slags, and the charges the highest in sulphides were melted with the expenditure of six and one-fourth per cent of Connellsville coke, with a ratio of concentration of about ten into one. This was done with the unheated blast under circumstances that convince me that with moderately heated air, raised to the temperature say of 400° F., the fuel expenditure could have been diminished one-half. But notice the conditions that have to be maintained in the furnace: There is no surplus of heat to spare; the slag is only hot enough to secure its separation from the matte; the rate of running is not over two and a half tons in twenty-four hours to each square foot of hearth area, and the furnace is always in imminent danger of freezing up. But little matte is formed and it is likewise far from hot, besides being (a consequence of the considerable degree of concentration) quite rich in copper and therefore tends to build up the crucible with solid matter. The smelting was done in a water jacket; it should have been carried on in a brick or stone stack with walls at least two feet thick, in order to avoid the loss of heat, the more so as in smelting at this slow rate and with so little fuel and excess of heat, there is not the slightest tendency to corrosion of brick walls and consequently no reason to employ jackets. The same reasoning applies equally to most forms of pyritic smelting, wherein I am satisfied that the use of water-jacketed surfaces is a great mistake. Smelting at this slow rate brings about some conditions injurious to the process, in that the crucible or fore-hearth are liable to chill up, and a rate of running slower yet will put an end to the operations. In order to continue slow running, with its attendant high concentration and cooling of the hearth, it is necessary to return much matte to the charge, the action of which is to heat up the crucible and render tapping easy, while its combustion, which takes place to quite an extent each time it goes through, effects a desirable enrichment of the substance itself, while providing a proportional amount of metallic oxides, which immediately enter the slag, increasing, as a rule, its fusibility and liquidity. Even in lead smelting, where no chemical action of this sort can be expected, it is not uncommon for the furnace men to feed "iron" (matte) in order to, as they express it, "warm up the bottom," the effect being to transfer heat from the upper to the lower part of the furnace. If, then, such an effect is produced by the mere melting and passing through of matte (and any very fusible substance will have the same effect), how much the more effect the operation must have where a decided oxidation takes place during the downward passage? I am convinced that the regular feeding of matte as a part of the charge will be a recognized part of pyritic smelting when a further concentration is desirable, when the process languishes for want of heat and when the condition of the bottom demands attention. The matte, in order that its sensible heat should not be sacrificed, should be fed in a hot, that is to say, in a molten condition. This device, on which I have taken out letters patent, reaches its highest usefulness in the case of difficultly fusible mixtures, where the fuel supply is too low to properly melt the charge. When the furnace is fed low, so as to bring the fire near the top, and when an excess of oxygen finds its way through the charge, the matte is tapped from the crucible or fore-hearth and elevated to the feed floor and poured into the furnace in a thin stream which breaks up into particles which are scattered over the surface of the ore and find their way down the interstices. A portion is burned, producing heat and flux, and the remainder sinks into the crucible again, transferring to that part of the furnace the heat which is required to keep it in good working condition. I think that metallurgists may rely with entire safety upon this plan as fulfilling the functions for which it is designed.

HOT AND COLD BLASTS.

Heating the blast confers two principal benefits: First, economy of fuel; and, second, the improved working of the furnace. Both are very important indeed, and well nigh indispensable where fuel is costly, or where the slags are difficult of fusion, or where the matte formers predominate in the smelting mixture. There are two principal ways of heating the blast: First, by means of fuel burned outside the furnace, in a special firebox, by which the air for the blast is heated in pipes under pressure as in iron manufacture, as has been practiced in the several Austin plants; and, second, according to the plan that I have proposed, wherein air contained in a confined space, but not necessarily under pressure, is heated by the waste heat of the slag which has issued from the furnace and is on its way to the dump. My method has not yet been put in practice, and I make no claims or assumptions concerning it; but it appears to me that a temperature of at least 500° F. should be got by this means at no expense whatever, excepting interest on cost of plant, and trifling wear and tear. One thousand degrees can be attained by means of the pipe stove, and between the two systems the question would be as to the balance of advantages between 500°, which cost nothing, and 1000° got at the expense of fuel, labor and repairs.

INTERNAL FORM OF FURNACES.

The interior form of the shaft exerts an important effect upon the smelting process. Narrowing the smelting zone in the neighborhood of the tuyeres so as to concentrate the chemical action assists in a remarkable degree the reduction of oxides and the production of metals. Accordingly, we find furnaces designed for the production of metallic lead, copper and iron constructed with boshes as a rule, or at least diminished in size toward the lower part, a common type being the jacketed copper stacks used in Arizona, which are inverted frustra of cones. Furnaces of such form were at first used for pyritic work, and, singularly enough, are still recommended for the purpose by some individuals. The proper form, however, possesses vertical sides, as a little reflection will have shown the reader. With such a construction we get a diffusion of the blast through a greater mass of the charge, and consequently enlarged opportunities for the passage of uncombined oxygen upward from the tuyeres into the region where the heated sulphides are ready for combustion. We also get, it is true, a lower working temperature without than with the boshes or inward tapering sides, and this seems at present a real drawback to the process, for it compels us to use slags of lower fusing point, though this we may possibly obviate by the use of the heated blast.

It is matter of common knowledge, also, that the height of the furnace shaft exerts an influence on the action, those furnaces with the higher stacks effecting the greatest reduction of oxides. We therefore reason that the pyritic furnace should be low. Our reasoning is borne out in practice, and it seems to the writer that a greater depth of charge than four feet, or possibly five, with ordinary charges is a grave mistake. Again, inasmuch as the oxidizing influences are at work along the sides only, not extending far into the center of the mass of ore, it appears that the capacity of the furnace will depend upon the interior length of its walls. In designing a furnace for a given output, therefore, the question is rather one of the peripheral extent of the structure than of tuyere area.

LOSSES IN PYRITIC SMELTING.

There are, as usual, three principal sources of loss, namely, (*a*) loss in slags, (*b*) loss in flue dust, (*c*) loss by volatilization. Regarding the first two, there is no more to be said than that they exist to the same extent as in the German system and in lead smelting, and have the same effect upon the percentage of extraction of the precious metals. I will therefore dismiss this part of the topic by saying that the pyritic slags are as free from precious metals as those made by the lead and copper matte smelters, and are as free from copper as the latter habitually make.

Regarding volatilization losses we are somewhat in the dark. It is unfortunately the case that most of those who have practiced pyritic smelting, and particularly those who have exploited its processes, have left us in ignorance of the losses suffered in their work. Only rumors and unacknowledged statements concerning the work in the Rocky mountain region are at hand to base our estimates and conclusions upon, and these emanate largely from lead smelting people, some of whom are inimical to pyritic smelting as a rival to be feared. I will therefore say no more of the work in that region than that we have good evidence of its success in one locality, where a plant continues in operation though surrounded with lead smelters. Its losses, therefore, cannot be great, and most probably reach no higher percentage than its neighbors. Another pyritic works, running on difficult charges of zinc-bearing ore, are said to have suffered a loss by volatilization of eighteen per cent of its silver. We are further informed that "fire tops" always prevailed at this furnace.

In a campaign of three weeks at Mineral, the furnace treating a variety of mixtures and producing a concentration at times of forty into one, the combined slag and volatilization losses amounted to 15 per cent—a result due in part to overmuch experimenting in unknown fields of research. In another campaign in which 1800 tons of ore were smelted, my losses footed up 11 per cent of the silver, part of which I ascribe to volatilization in the furnace, part to the unavoidable losses in slag, and the remainder to the experimental bessemerization of a part of the matte. These intolerable losses were experienced under circumstances that suggested the causes and the remedies; and the latter being employed, the losses were subsequently largely obviated. Without going into the remote causes of volatilization of silver, I have only to say that they are mainly controllable by furnace manipulation, experience showing that they may mostly be checked by merely running with a cold top. Hot tops in any furnace smelting lead or silver ores are a potent cause of losses, but do not, as it appears, cause the volatilization of copper or gold. Compare the heavy discrepancies mentioned with later results at Mineral, where with more experience but less tractable ores the savings reached 95, 97 and 102 per cent of the silver in different campaigns. The latter result, unexpected but not unprecedented, serves mainly to emphasize the inaccuracies of assay methods.

Bartlett, in that form of pyritic smelting known as the zinc-lead process, finds that he sustains a loss of from six to fifteen per cent, varying, I presume, in accordance with the intensity of the pyritic agencies in use at the time. In this process a large part of the charge is intentionally volatilized, and the conditions of the work appear to be such as to render heavy losses unavoidable. Indeed, it seems to me remarkable that they are so small.

I will conclude these remarks upon the subject of silver losses by recalling the fact that the experience of those engaged in bessemerizing copper mattes is that the losses of silver are very large, so large, it would seem, as to preclude the use of that process for the treatment of most argentiferous mattes. At the same time the losses of gold are quite slight. Both these results correspond with what we might have expected from our knowledge of the habits of the two metals.

CONCLUSION.

Pyritic smelting to-day lacks nothing in conception or in principle or in scope of usefulness. What it lacks is chiefly the effort of scientific adepts and of skilled operatives, the one to make known its underlying principles, the other to carry on its practice. Thus far but few men have become educated either in its principles or its practice, and there is and must be a vast amount of misdirected effort, the result of which is inconclusive, and in the eyes of the world can only serve to confirm the doubt with which all new processes are received. In popular estimation pyritic smelting is a "patent process," the property of one man. In fact, it is an immensely broad conception whose important and indispensable features have not been and cannot be patented. In looking over its almost boundless field it seems to me that its most profitable immediate application is in the treatment of difficult ores in isolated districts, in fields altogether new, or supplanting in older localities less effective processes. With the improvements that have taken place in smelting in general, and with the increased range of usefulness of the matting processes in particular, there is every reason to expect that matte smelting will indeed supplant in the not distant future (*a*) those processes which fail to yield a high percentage of metal, (*b*) those which, like amalgamation, afford no valuable by-products, and (*c*) those which, like lixiviation, require costly preliminary experimentation and give an uncertain yield.

Gov. Budd.

"Jim" Budd was inaugurated Governor of California last evening with imposing ceremonies. Herewith is presented a good picture of the man who has been chosen by the commonwealth to fill the chair of the chief executive for the next four years. At the last session of the California State Miners' Association Gov. Budd was present and made an address, which went far to justify the belief of the miners that in the new Governor they would find as good a friend and fair an ally as they had in the retiring State executive, Gov. Markham.

HON. JAMES H. BUDD, GOVERNOR OF CALIFORNIA.

An Interesting Reminiscence.

A good many old timers in California who remember John Conuess, now living in Boston, Mass., will read with interest the following. Writing to an old friend in Tuolumne Co., Mr. Conness says:

Once in my California life I invested in one of the rich mines on Amador creek, where Hayward obtained his first fortune. He was a placer miner in El Dorado, near where I lived. At that time there was one stamp mill in place and at work on Amador creek. It was of an English pattern. The shafts of the stamps were square beams of wood, not less than eight or ten inches square, and the cams ran into mortises in the shafts, by which the stamps were lifted. I was one of two appointed by our company to go to San Francisco and have a mill made to work our lode. Observing the Amador mill work and noting its clumsiness, and, afterward, on the way down the Sacramento river on the steamer Confidence, observing what are called the lifting rods of the engine rise and fall through metallic boxes, smoothly and wholly without friction, I adopted the plan of having the shafts of the pestles made of iron, turned smoothly, and run in metallic boxes, like those on the engine of the steamer Confidence. A shoulder was keyed on the shaft or lifting rod, so that the cam could lift readily; but as the shaft or rod was round, and so that the lift might be done by a hold on both sides of the rod against the keyed shoulder, we had the cam made with two arms instead of one, just like two of your fingers. The mill was erected and it worked beautifully.

Now, one of the difficulties of the English-pattern mill was that the stamp rose and fell perfectly straight. It worked between two heavy beams of wood, which were horizontally placed to keep the rise and fall of the pestle within its narrow bounds. The result of this was that the ore or rock would get into the angles of the mortar and the faces of all the pestles would become worn unevenly, and, finally, either side of a pestle would look like a wedge and fall with a thud, not doing its work of pulverizing the ore. The pestles were constantly being removed to be cast over, and as often wearing unevenly on their faces.

Our mill being round and swinging a little to the right and left, and, as you will see, having no lateral beams keeping square pestle rods rising and falling perpendicularly, was a great improvement on the face-wearing plan, which was seen at once. But one day one of the cams lost one of its forks, or fingers by breaking off at the junction and, at once this stamp, while it raised with perfect ease, had an increased swing, rotating from one side to the other, and its face, having an equality of wear, did its work beautifully. There was no crowding of the ore from one side of the mortar to the other; it was a mechanical revelation. We had all the cams made with one finger, or wing, and did more for quartz mining than was ever accomplished in any other way.

Our company employed one of its members—a lawyer—to superintend and do the work. There was neither let nor hindrance to his management, but in a year or two we closed up the mine, assessed ourselves, paid the debts, and quit. A. H. Rose took the mine afterward and made a great fortune out of it. I had much experience in mining and put a good deal of money in it, and what I learned was that the best mine in the world could be frittered away, for want of good judgment in its management.

* * * * * JOHN CONNESS.

Mining Reports and Mine Salting.*

By WALTER McDERMOTT.

Mining Reports.—Some apology, or at least explanation, seems called for in the introduction of this paper; for, while the subjects treated are of interest to all engaged in the mining business, they become more or less personal in character when written on, and tend to drift into the form of a lecture. Should these objections become too apparent to the members, they will perhaps exercise a proper toleration in view of the fact that we have with us not only associates whose age precludes any lengthy practical experience, but also students who have still perhaps to go through somewhat the same experiences as are referred to in these notes. It has been my fate during the last twenty-three years not only to write a fair number of reports myself, but also in the course of business to read a vast quantity of reports by other people; and it is much easier to find out the weak points of others to point a moral than to set a proper example oneself. The proper examination of and reporting on mines can never be covered by a set of rules, for in this work the personal equation plays an important part, and training, ability and even experience are all insufficient in many cases unless accompanied by the common sense and sound judgment necessary in all business transactions.

There is such a great variety of badness in mining reports that a little grouping of the cardinal sins will be useful. In speaking of mining reports generally, for the purpose of illustration, I intend to cover not only those made by mining engineers, but all those used in business, and so fairly subject to criticism, from that of the learned professor of other sciences who is dragged from the seclusion of his study and put underground, to be made miserable with candle grease, down to that of the practical miner, who, having beaten a drill for a certain number of years, is prepared to dogmatize also on facts, figures, theories and conclusions.

Among the old friends we meet in numberless reports, and which seem to need a little protection against excessive wear and tear, the following will be considered:

1. The true fissure vein.
2. Increasing width in depth.
3. Increasing richness as depth is attained.
4. Junction of veins.
5. Ore in sight.
6. Proximity to a rich mine.
7. Failure from mismanagement.

Now, heaven forbid that I should be held as speaking disrespectfully of any one of these things, each estimable in itself. My remarks are pointed only against their indiscriminate use, and particularly against their public use as catch-penny phrases in a way to imply more than they actually mean.

The True Fissure Vein.—There has been more joy over this one term than over anything else in the history of mining. The investing public has become intoxicated with the exuberance of its descriptiveness. The practical miner has grasped its effectiveness, and the first ring of his pick on an outcrop satisfies him he has got the genuine article with tap roots in the Antipodes. What is a true fissure vein? It is supposed to be a fissure in the country rock filled with veinstone, which may be expected to go down to a considerable depth. The veinstone itself sometimes carries pay ore. This does not seem much to base any elaborate calculations on; and not only is it insufficient, but experience all over the world has shown that some of the most valuable ore deposits are not found in fissure veins at all.

Even as far as mere depth is concerned, it is by no means yet established that true fissure veins go any deeper into the earth's crust than bedded deposits, contact or pipe veins; and it would be of no consequence if they did go deeper, since they cannot be followed. I have read a report of a geological expert who expressed himself as ready to stake his reputation that a certain vein would go down and carry its value to at least 1000 feet. Properly used, the term "true fissure" is usefully descriptive, but where used as an incantation to call up visions of wealth to an unlimited depth it needs suppressing.

Increasing Width in Depth.—It is naturally gratifying to the owner of a mine to see his vein increasing in width as he goes down on it. It also looks well as described in a report, and must naturally be mentioned when it occurs; but in some reports the implication arises that it is a vital point and to be calculated on as continuing. If a vein went on increasing in width it would very soon attain enormous dimensions; and if it outcropped in a country blessed with the law of the apex, its lucky owner would have a good claim to a very large proportion of the earth when he got down a few miles. It may pretty safely be assumed that the increase in width will not continue, and when it stops it is very likely to be succeeded by a corresponding decrease, so as to keep up the usual average of things. When, say, a fifty-feet shaft sunk on a vein shows an increase in thickness from one foot at surface to six feet at the bottom, there is nothing to show that in continuing to sink the vein may not gradually or rapidly pinch again to its size at surface, or even much less. If any calculations were justifiable at all in such a case, general experience would certainly lead one to expect such decrease. The only positive conclusion would be that the vein is irregular in width. It looks nicer and more definite in a report to say simply "the veiu is steadily increasing in width as sunk on," than to state that "the width of the vein is variable, running from one foot to six feet, and therefore until further opened in length and depth its average cannot be safely calculated on." The one statement is as true as the other, but the effect of the two in reading is not the same.

Increase in Richness.—There is a touching confidence in the belief of many practical miners that veins get richer as they go down. Experience and disappointment often fail to shake this comfortable belief. The remarks made as to irregularity in width apply equally to increase in richness with depth. Most practical men are able to cite a great many more examples of rich mines becoming poorer with depth than the reverse. I remember being struck with the inconsistency and persistency of the belief in depth in various camps of the Rocky mountains. Up to the highest ranges, say 12,000 feet above sea level, there are mines which need sinking on to prove their real value; and 7000 feet below them in the foothills are mines equally needing depth. Probably the thought at the bottom of this belief rests, like some of the attractiveness of the true fissure veins, in the old idea of a central seething mass of precious metals, and in the forcing up of a molten vein-filling. This faith in the saving grace of depth and of true fissure veins, in the face of facts, can only be explained by the definition of faith as given by the little girl; viz., "believing what you know is not true." The hankering for depth has its justification, of course, in the necessity for sinking usually to get any developments, but where access is obtainable to the foot of a mountain through which a vein runs, the same men who claim a special efficacy for depth in other cases will point to the vast advantages of having the ground above one to be opened by adits. The facts of experience show that when a vein is rich at the surface, a hope that it may continue is a more proper attitude than a belief that it will get richer in depth; and when it is poor on surface, any change in sinking would be for the better. Naturally these remarks do not apply to cases of known ore shoots of established directions.

Junction of Veins.—Striking cases of enrichment of veins at their junctions occur; but, as many examples of junction without richness also exist, it does not do to attach too much importance to the results to be expected. In some reports the future junction of two veins is often itself assumed on insufficient data, and the consequences are calculated on with a certainty which is still less to be justified. In this, as in other matters, Nature seems to have a rooted objection to fixed laws of clear and simple expression, and prefers them with so many "buts" and "ifs" that she is still practically free to do as she pleases.

Ore in Sight.—Under this head is included matter which is of the very greatest importance, and which requires the very best work of an engineer. The estimation of ore in sight in an opened mine often involves the consideration of so many points, and is so largely a matter of good judgment, that one may expect some discrepancy in the reports of different engineers. There is nothing in which such vast discrepancies do exist, in fact, as in regard to this. Two good engineers will vary in their estimates, and when it comes to inexperienced men, or to so-called practical men who have no reverence for the written word, the term "ore in sight" becomes a theme for the exercise of the highest flights of imagination, and the airing of a little rudimentary mathematics. In the common mining report we are all acquainted with, it is not unusual to see the length of the chain multiplied by a cheerfully assumed average width of vein, then by 500 or 1000 feet for depth, and a tonnage deduced which reminds one of the figures used for astronomical purposes. Sometimes, to inspire extra confidence, the expert generally knocks off 25 or 50 per cent, and feels he has then done his duty, whatever happens. The character and ability of a man can sometimes be closely estimated from the way he figures up ore in sight after giving the dimension bearing on it, and it often suffices to look at this calculation in order to determine a report to be not only quite unreliable as to conclusions, but equally irresponsible as to data.

In connection with estimation of ore in sight, the system of sampling employed is worth mentioning here. In some reports the expert writes of taking samples "at random." When a man says he has picked some samples from a dump "at random," and they assay well, he implies that such ore is plentiful on the dump, and that he did not purposely select it from its appearance. What his statement actually means is, that on an important matter he was willing to trust to luck as to whether he hit poor or rich ore, or whether he was getting just what had been previously placed for him to get. Luck is a very necessary thing in mining, but it should not enter into sampling. If the sample is a random one its value proves nothing. Some people seem to think this method of sampling is important evidence of an impartial mind, and that shutting the eyes is the best security against the frailty of human nature, which would otherwise lead a poor creature to pick out the richest looking ore he can find.

Another little weakness to be remarked in some reports is the willingness to make a liberal discount off the expert's own figures. The writer concludes, for instance, from his samples—perhaps taken at random—that a gold vein will average two ounces of gold to the ton, but, to be on the safe side, generously offers to take it at one ounce, and then with a light heart goes into calculations by day, and month, and year. If a man knocks off 50 to 100 per cent from his supposed reliable figures to be safe, it always occurs to me that the one who reads his report may feel tempted to lop off another equal percentage to be still safer.

I do not wish to be understood as condemning the very proper allowance which a careful man will make for the difference between results of milling large quantities of ore, and the assays of samples from the clean veinstone, owing to intrusions of waste rock and breaking down of country rock in mining when everything practically goes to the mill without sorting. The system here objected to is that of doing careless sampling, and then making a heavy deduction to give the appearance of being on the safe side.

Unless a vein is very regular in value, the careless averaging of assays by mere numbers, without reference to the relative quantity of ore represented by each sample, leads to most misleading conclusions.

Proximity of a Rich Mine.—There have been plenty of illustrations lately published in prospectuses of the great value the public places on a property which is near a well-known mine; yet every one who knows anything of mining must be aware that mere proximity to a paying mine gives no assurance of similar success. The extraordinary continuity of the paying reefs at the Randt—an occurrence not applicable to quartz mining in any part of the world—seems to have caused a forgetfulness of the past costly experience in reckless mining investments by English companies. In Western Australia, although all evidence seems to point to some very valuable properties, it will be a truly extraordinary thing if there is not a great deal of disappointment resulting from the loose and unconfirmed reports lately published in some prospectuses, and which reports are illustrations of most of the defects mentioned in this paper. Some of these reports are absolutely nothing but a statement that the claim examined is on the same reef as, or near to, another property which is popularly supposed to be exceedingly valuable, and that rich ore has been found on the claim. Not a single attempt is made to describe the proportion of rich ore to poor rock; in fact, there is no mention of anything poor, so that the inexperienced are left to suppose that the full width of veiu is rich ore.

In quartz mining it sometimes happens that a series of paying mines are found at intervals along a single vein. Occasionally the intervals between pay shoots are long, so that a good mine may be immediately surrounded by poor ones. In other districts one single good mine on a vein is all that is ever developed. The only actual advantage of the proximity of a good mine is the evidence it affords of there being payable ore in the district, or on a certain reef. Like other indications, it is of service only when used with discretion, but as an unqualified argument of the value of a neighboring claim it is most dangerous.

Failure from Mismanagement.—That bad management may spoil a good mine is so self-evident a proposition that no one will misunderstand a few remarks against the improper or thoughtless use of this excuse in a report as an explanation of previous failure in a poor mine. A well-known Californian mining man, when asked to take charge of a mine which had failed to pay—as it was explained—from mismanagement, answered that he did not want anything to do with a mine which would not stand bad management. This is a remark which contains much matter for reflection, and embodies the opinion of most practical men. In reports the statement is sometimes loosely made that milling results in the past cannot be relied on, owing to primitive machinery or processes hitherto employed. This argument has often been advanced on Mexican mines by experts who have not had time to find out that native methods of working often give better results than the rapid working of the most modern machinery. With free gold ore it often happens that very simple and crude machinery will give quite fair results; an arrastra, for instance, will beat a stamp mill. In calculating on such past work by the owners of a property, it must not be overlooked that, even if they did fail somewhat in theoretical extraction, they probably selected better than the average grade of ore to begin with. Therefore, when average assays indicate higher milling value in a report than past returns, it is natural to look with suspicion on the sampling, unless some good explanation, better than the supposed blundering of former management, is given. Such explanation is, of course, simple enough when the process previously used is evidently not adapted to the ore; but it must be shown, not assumed because the machinery seemed to be crude.

The difference between the method of an experienced, responsible engineer and that of the inexperi-

*Paper read on Dec. 19, 1894, at the meeting of the Institute of Mining and Metallurgy.

enced or reckless expert, is that the former takes as little for granted as possible, aud will not prophesy unless he knows, while the latter gives the reius to his imaginatiou. We all remember the luxuriant crop of reports in the early days of South African gold mining, written by authorities whose previous mining experience had been coufiued to the costeaning of a potato patch, or to exploratory operations on their neighbors' bank accouuts. Some of these sanguine gentlemen, who took every surface showing gold as sure evidence of vast wealth below, scored some brilliant successes on the Randt, although their ounces became pennyweights in working; but when they extended the system to the regular ruu of gold veins in other parts of the country they met the usual slap in the face which nature keeps for rash prophets. The careful man is of necessity at times discredited in the opinion of those who misunderstand his responsibilities, by reason of his refusal to become excited by a good surface show, which his experieuce tells him is no safe guide as to depth; while the reckless and inexperieuced will freely call on their imaginations. There are cases of this description iu which, however rich a miue may afterward prove, it is more creditable to have been cautious than to have been sanguine in the early stages. If it would not be held as rather unduly exalting the profession, I should quote in this connection, "Fools rush in where augels fear to tread."

After all these remarks as to what mining reports ought not to be, it is perhaps permissible to say a few words on what they ought to be, but with the apology to our inexperienced members already referred to in introducing this paper.

A report need not be long winded to justify the fee paid for it, but should be so full in actual description as to enable a reader inexperienced in mining to draw his own conclusion from the facts given, without having to trust entirely to the deductious of the writer. Where a fee is paid for a simple expression of opinion or specific advice, there is uo need of a report, in the seuse of the word as we are now considering it. The important details to be set forth clearly are those relating to position, and facility of access to the property; local conditions as to fuel and water, and timber supply; extent and form of openings; variations in thickness of deposit; character and value, and form of occurrence of ore. It is important in giving a clear idea of the property that the distribution of the payable ore in the deposit should be described. It makes a great difference sometimes in the conclusions to be drawn, whether the value consists in rich ore occurring iu a barren vein mass, or in high-grade ore scattered through a low-grade deposit, or in a uniform value throughout the rock. On account of the necessity for this description, it is uot always sufficient to state that an average width of vein contaius an average of so much value per ton, as this may be in the nature of a conclusion, not of a fact, and so may need to be justified by detailed facts of the report. The extent and character of dump piles at a worked mine often afford valuable confirmatory evidence as to the character and value of the property. I have seen reports in which piles of rich ore were stated to be ou haud at the mine in certain quantity aud value; but on figuring out the experts own statements as to width of pay ore and extent of openings, it was clear the hole in the grouud could uever hold the ore said to have come out of it. The configuration of stopes in a worked mine often gives very suggestive ideas as to the run of pay ore, and as to the probable character of ground still standing.

Geology and mineralogy should naturally be used with discretion, but only for purposes actually bearing ou the description and conclusions to be drawn, not for mere paddiug, nor for the airing of theories better treated in a purely scientific paper. I have seen a report which started with the nebular hypothesis, and traced the progress of the earth from its pulpy state right down through its various stages to oxidation of the outcrop of a particular veiu in the year of grace in which the report was written. These details were so full that there was no room left for anything but a brief treatment of the merely commercial question of the value of the mine.

Examinations naturally differ greatly in the nature of the calls they make ou the expert. In a district with which he is well acquainted there are often certain simple facts which enable him rapidly and safely to arrive at his conclusions; in other cases it is often a matter of hard and conscientious work, however clever or experienced the engineer may be, and any scamping of this work will imply unreliableness.

Finally, au experienced man in making a report will have au open mind for possible uew forms of orc occurrence, while refraiuing from prophesy about things not iu sight. Events may work against the most careful and experienced man by unforeseen increases or decreases in value ou opening new ground; but as mine examination is au art and not an exact science, it is by average results that au engineer must be judged. A mining eugineer has ouly ordinary eyes, aud so, as Sam Weller says, his "wision is limited"; if he had "a pair o' patent double-million magnifyiug gas microscopes of hextra power" he might look into the earth a little farther.

(To be continued.)

Mr. Badlam Objects.

Quite a flurry has been caused among the directors of the Bullion–Beck & Champion Mining Company during the past few days by the presence in the city of Alexander Badlam of San Francisco, who represents a minority of the stockholders of the company.

Mr. Badlam arrived in the city last Monday in response to a telegram, and reached a meeting of the board of directors in time to hear a resolution read which proposed the purchase of the Caroline mine from John Beck by the Bullion–Beck Company for the sum of $175,000. After listeuing to the reading of the resolution, Mr. Badlam spoke right out in meeting and vigorously opposed its adoption on the ground that the ore in the Caroline was already the property of the Bullion–Beck Company, and no action was taken upon the resolution.

On January 2d Mr. Badlam addressed the following communication to each of the directors of the company:

DEAR SIR: You are one of the hoard of directors of the Bullion–Beck & Champion Mining Company, and the subject of huying the Caroline mine from John Beck is now hefore the board. I am a stockholder in the company, holding a considerahle hlock of shares, and I represent other large stockholders. I warn you against concurring in the purchase. The company owns now all the ore under the surface of the Caroline mining claim, and the Caroline is not worth a cent. If the company purchases the Caroline with your vote, myself and associates will look to you personally, and hold you responsihle for the loss and damage to the stockholders of the Bullion–Beck & Champion Mining Company. ALEXANDER BADLAM.

Yesterday Mr. Badlam and Mr. Beck held a consultation, and finally agreed to submit their differeuces to a board of three arbitrators; but after Mr. Badlam had uamed W. H. Dickson as his representative, Mr. Beck refused to arbitrate, and the gentlemen parted.

Mr. Badlam returned to San Francisco last night. —Salt Lake Tribune, January 3d.

Coal Importations.

The following tables sbow the sources of California's coal importations for the past four years:

	1891, Tons.	1892, Tons.	1893, Tons.	1894, Tons.
British Columbia	652,657	554,600	588,527	647,110
Australia	321,197	314,280	202,017	211,733
English and Welsh	168,586	310,660	151,260	157,562
Scotch	31,840	24,900	18,809	18,636
Eastern (Cumberland and Anthracite)	42,210	35,720	18,960	16,640
Seattle (Franklin and Green River)	178,230	164,930	167,550	153,199
Carbon Hill and South Prairie	196,750	218,300	261,435	241,974
Mount Diablo and Coos Bay	90,684	66,150	63,460	65,263
Japan, etc	20,679	4,220	7,758	15,637
Totals	1,702,833	1,593,850	1,479,785	1,527,754

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Scientific Progress.

Soldering of Aluminum and the Production of the Metal.

It has been said that the great objection to the widespread use of aluminum as a substitute for other metals now in daily use is that it cannot be effectually soldered. True, so far, there has been some difficulty in finding a suitable solder; but, as was to be expected, when the metal came more and more into use and got better known, as it has done during the last two or three years, many inventors have devoted their time and attention to the solution of this problem. Ten patents for soldering have been granted. Two or three of these processes have passed the experimental stage and are now being used.

One of the difficulties found in soldering the metal has been that the quality of the solder used could only be ascertained after a certain period had elapsed, so that, while some of the solders seemed to have answered very well at the time of application, after a few weeks or a few months' time the pieces which had been joined could easily be broken again.

Aluminum is easily oxidized, and as soon as it is exposed to the air, however brightly polished it may be, it instantly becomes covered with a thin film of oxide of aluminum. This peculiarity is a decided drawback in soldering, although in other uses it constitutes one of its best qualities, the thin film preventing the metal from becoming further oxidized, and thus keeping it from turning black as with silver, copper and other similar metals.

The secret is to see that the pieces of aluminum to be soldered are entirely free from any oxide, otherwise it is said to be utterly impossible to join them strongly together; in fact, one might as well, it is explained, try to join two pieces of rusty iron together.

The process for soldering aluminum, recently invented by M. Ludwig Oliven, seems to have overcome this difficulty, and exhibits recently shown have stood requisite tests. The invention consists not only of the new solder, which is an alloy of several metals, but also of the combination of this solder with a suitable patent furnace for keeping the metal at the right temperature at which the operation should take place, and also with the arrangement of brushes and other tools, with which the surfaces may be scraped and cleaned so as to get the solder well into the metal. Small pieces can be soldered by means of the blowpipe, but when large pieces of the metal have to be treated, and especially when the solder has to be of an exceedingly good quality, it is most advantageous to make use of the special furnace invented for this purpose. The entire process is simple. Any workman by this process will be able to solder any pieces of aluminum just as simply as he can any other metal. Pieces joined together by this process have been submitted to crucial tests and have proved more difficult to tear apart than brass united with tin solder.

The fact of being able to solder aluminum by a simple and cheap process should enormously extend the uses to which the metal may be applied.

The annual output of aluminum has increased from 50 tons in 1890 to about 2500 tons in the last year. The price of the metal has, at the same time, diminished from $15 per pound in 1889 to about 40 cents per pound at the present time. As aluminum weighs, bulk per bulk, only one-third of the other metals now in use, the least mentioned price corresponds favorably by comparison.

All the aluminum sold in the market is manufactured by electricity. The largest factory in the world engaged in the manufacture of aluminum is one at the Falls of the Rhine, at Neuhausen, Switzerland, which is capable of producing 1000 tons per annum. The second largest factory is in the south of France, which uses water power from the Alps, with an annual output of 600 tons.

Detecting Dynamiters.

Chemistry is offering a means to oblige would-be dynamiters to betray themselves should they try to carry about hand grenades and cartridges. It is to mix dynamite with certain salts that give out a stench, and plunge cartridges into a solution of these chemicals. This fœtid smell thus caused is not to be got rid of, and is communicable. A person carrying this infernal machine, or who had carried or handled one, unless with leather gloves which had been taken off with great care, would be at once detected by the odor.

In a communication to the mining society of Nova Scotia, C. E. Willis says the metamorphic rocks and serpentines of Quebec dip under the Gulf of St. Lawrence to re-appear on the western coast to Newfoundland, and extend probably across the island. The district, situated at and near the eastern coast of Port-au-Port Bay, near the southern boundary of the serpentine rock, is seamed in many places with asbestos, and contains veins of copper and specular iron. Only surface work has been done so far, but the asbestos fiber is of good quality, up to 2½ inches long, and practically identical with the Canadian product.

A SCHEME has been proposed to reduce the friction of salt water against the sides of a steamer, which, it is claimed, will increase the speed forty per cent. It is to force air through the vessel's plates and thereby form a narrow space between the iron and water.

Horseshoes of Cast Steel.

Every now and then one hears of an attempt to make a horseshoe by casting instead of forging it. A Chicago firm produced a lot of such shoes a year or two ago, and the experiment has been tried by others. A few weeks ago, in Glasgow, there was a public exhibition of a new attempt in this direction. A mould of steel was used, and this was provided with such mechanism that, immediately after the shoe is cast the matrix may be opened, whereupon one lever causes two cutters to remove the surplus metal, and another operates punches which make the holes. The steel used was a Bessemer, made by the Walrand-Legenisel process, whereby great heat and fluidity is secured by putting a little ferro-silicon into the converter just as the blow is finished. It does not appear from the story at hand whether or not toe and heel calks are formed on the castings, but one is left to infer that the blanks are in substantially the same unfinished condition as the forged shoes now so extensively used in this country. The latter require not only the addition of the "clip" and calks, but also more or less shaping at the hands of the shoer, to fit the horse; and it is difficult to see how such work can be done on a casting, owing to its brittleness.

It is now something like forty or fifty years since machine-made shoes were introduced in the United States. These met with opposition from blacksmiths at first, but they have grown in popularity until now the great majority of working-horses out in Eastern rural districts are thus shod. In cities, too, they are in constantly increasing use. Street-car companies which still rely on horse power, use machine-made shoes. In many cases a better quality of iron is employed in manufacturing these shoes than is sold to the blacksmith for the hand-made article. Many owners of private carriages imagine that the latter style of shoe is preferable; but within five years a light machine-made shoe of Bessemer steel has come into the market, which seems to be well adapted for this class of custom. There is nothing like it in Europe. The machine-made shoes in general have not been appreciated so fully and promptly there as on this side. Of course, the great majority—say ninety-five per cent—of them are made of iron, and not of steel; but veterans in the trade scoff at the idea of casting the metal, whether it be one or the other, for the reason already given.

Commercial Products Obtained from Sharks.

Sharks, says a writer in the *Revue Scientifique*, furnish quite a number of valuable products. Thus, the liver of the shark contains an oil of a beautiful color, that never becomes turbid, and that possesses medicinal qualities equal to those of cod liver oil. The skin, after being dried takes the polish and hardness of mother of pearl. It is marbled, and bears a resemblance to fossil coral. It is used by jewelers for the manufacture of fancy objects, by binders for making shagreen, and by cabinet makers for polishing wood. The fins are highly prized by the Chinese, who pickle them and serve them at the end of a dinner as a most delicate *hors d'œuvre*. A ton of fins usually brings (at Sydney) $140. The Europeans, who do not yet appreciate the fins of the shark as a food product, are content to convert them into fish glue, which competes with the sturgeon glue prepared in Russia. This glue is employed for clarifying beer, wine, and other liquors. It is used also for the preparation of English taffetas, as a re-agent in chemistry, etc. The teeth of the shark are used by the inhabitants of the Ellis islands for the manufacture of weapons of war. As for the flesh of the shark, that, despite its oily taste, is eaten in certain countries. It is employed also, along with the bones, in the preparation of a fertilizer. The Icelanders, who do a large business in shark's oil, send out annually a fleet of of a hundred vessels for the capture of the fish.

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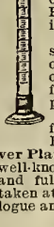
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Mendocino.

Press: About forty-five years ago a Mexican discovered a gold-hearing ledge near Ukiah, from which in a short time he succeeded in extracting a fortune, variously estimated at from $40,000 to $80,000. The rock was of such a character that even by the primitive methods then in use the gold was extracted in a comparatively brief period. Some weeks ago C. H. Stout, while prospecting the low ranges east of town, discovered evidences of former mining. At or near the stopes worked by these prehistoric searchers for the yellow metal he found rock that gives evidence of richness. He has located 600 feet of mineral land in the vicinity of his discovery and is sanguine over his prospects. Mr. Mathias, the expert of the State Mining Bureau, stated on a recent visit to this county that, according to his opinion, there were excellent prospects in Mendocino for the discovery of rich ore helts, and said that as yet the county had not been prospected. This is doubtless true. Expert miners have rarely visited this county, and it is yet comparatively a virgin field for the expert prospector.

Nevada.

WEST HARMONY MINE.—The West Harmony drift mine near Nevada City has again started. Work was discontinued some time since on account of water. About forty men will he employed at the mine from this time forward.

Placer.

HIDDEN TREASURE.—*Sentinel:* The Hidden Treasure Company at Sunny South, operate their drift mine on the most extensive scale of any gravel property in the United States. The company has just closed one of the most successful and profitable year's work in the history of this famous gold mine. During the past twelve months they have breasted and worked an area of 260,000 square feet of channel, which has produced 110,000 car loads of pay gravel.

Last fall a new trail was built from the old works at Sunny South to the month of their newly acquired Dam tunnel, a distance of about two miles. A force of five men are at present engaged extending the tunnel.

During the past year the average number of men employed has been 180. The amount of money disbursed by the company for labor and material has been a trifle over $101,000.

The tailings in Blacksmith Canyon, which came from the sluices of the Hidden Treasure mine at Sunny South, will probably be sold some time during the coming month. They have not been worked for about three years. The Chinese usually purchase them. They sell for many thousand dollars.

After being worked, the tailings pass into El Dorado Canyon, where they are worked over and over by the Chinese who have claims located in the canyons.

OPHIR.—*Herald:* At the Gold Blossom mine the miners were laid off December 24th, on account of the water being too high at the lower level. Work was resumed, but most of the men had to quit again forty-eight hours after, because of the breakage of a valve on the steam pump. The milling process at this mine will soon be complete, and everything in running order. Sinking has been resumed in the west drift at the 200-foot level. A large quantity of ore has been taken out, and it promises to be good. At present there are about twenty-four miners, or, including outside laborers, thirty-five men in all, employed at this mine.

At Gold Blossom No. 2 the stamp mill is running and a force of men are at work in the mine.

The Boulder mine is making preparations for a new start. Mr. Brown is putting in some concentrators, and when these are finished operations will commence in the mine.

San Bernardino.

San Bernardino *Sun:* The new year is likely to be marked with renewed energy in mining in San Bernardino mountains. The persons who own stock in the Rose mine are to be congratulated on a Christmas present of a substantial nature. A rich strike at the depth of 425 feet has just been made, probably the richest strike yet made, and certainly the most important one. The ore has been struck in a good solid formation, which means permanency. The Rose can now he called a mine, not a prospect. The striking of this ore at this depth is of the greatest importance to the mining industry of this county, and especially to the San Bernardino range. There has been a prevailing opinion that paying ore bodies did not continue to any great depth in this county. This will prove to the doubting Thomases that the greater the depth the richer the ore becomes.

Shasta.

SALE OF THE TELLURIUM.—The Tellurium gold and silver mine, three miles from Redding is reported sold to a San Francisco and Eastern syndicate for $300,000. The property was discovered by Peter Scherer some years ago, and he labored and struggled, spent every dollar he ever possessed and borrowed more to open and strike the main ledge. Finally he formed a joint stock company, issuing shares of the stock, which he placed on the market in this city and elsewhere.

Tuolumne.

Independent: J. H. Beal with D. R. Oliver, has located a quartz mine at Hog Mountain, six miles southeast of Sonora, the Tuolumne river cutting through it. The lode has been located on both sides. The croppings show ore that will yield from $6 to $8 per ton; plenty of water and timber at hand; will drive a tunnel right from the river bed. Mr. Beal has prospected, he says, over 8000 miles, and from Alaska to Peru also in Australia and Africa. He says that Tuolumne offers a better field for developing rich mines than any section he has ever visited. He says the hidden wealth of this county has never been dreamed of. Depth will prove this. He says: sink the Rawhide to 1800 feet, it will prove the richest mine in the world.

ARIZONA.

ON THE HASSAYAMPA.—*Journal-Miner:* J. A. Conlee has taken a twelve month's bond on the King Solomon group of mines, on the Hassayampa, eight in number, and two mill sites and a mill for $50,000. The mines are owned by Judge Abner Wade and others and as far as opened up look in fine condition. Mr. Conlee will put a force of men at work on the mine about February 1, and will push development work on the mine as well as the mill.

Needles *Eye:* An old prospector who has been examining the Wickenburg district says: "This is the hardest country I ever saw to prospect and no matter how good the man, he cannot go beyond the limits of his canteen. Water is scarce and in the mountains or on the desert men drink like fish. It is impossible to carry a supply sufficient to last any considerable leugth of time, and no matter how near the sturdy miner may he to the vein of glittering riches, when the canteen begins to fail he has played the limit. There are indications of gold everywhere, and Central Arizona will some day show many fine gold mines. The country has many surface symptoms, and the mineral in places is rather pockety."

IDAHO.

TO WORK IDAHO PLACERS.—The Blue Lakes Mining Company, consisting of Messrs. J. C. Conklin, president; J. E. Oglesby, vice-president; L. B. Gorbam, secretary; F. A. Virtue, treasurer; and C. J. Pence and J. B. Perine, of Salt Lake, will operate in Idaho, about twenty-five miles from Shosbone, to work 400 acres of placer mining ground. The company is capitalized at $125,000, with that number of shares. It bought the placer property in October last, and was engaged up to December 15th in erecting hydraulic and milling machinery. Since December 15th it has been experimenting with the plant, and is now prepared to announce that success has been met and that future prosperity is assured.

An entirely new milling process is involved in the mine. It is known as the Bard amalgamating machine. Full particulars of its method are not available at this writing, but it can he said that it employs a riffled copper plate, and uses quicksilver. The company has five of the machines in use, and has been able, with them, to save 95 per cent of the gold, while handling from 700 to 1,000 yards per day of dirt.

The hydraulic equipment of the mine includes about two miles of flume and ditch, with 1,000 feet of eight-inch pipe line. The pressure is 100 feet. Water is drawn from springs which have a flow of 3,000 inches.

Objection is taken by the company to stating the showing of the placers, on the ground that it is too high for general credence, though only so high as to cause the company to resolve to keep the mine in operation all winter.

THE LEASE SYSTEM.—Boise *Statesman:* Major William Hyndman, manager of the Philadelphia Mining Company's mines and smelter at Ketchum, says the lease system under which all of the company's mines are being worked is proving more advantageous to the company than when the mines were worked by the company, and the lessees are making money. Up to the time Major Hyndman took charge of the Philadelphia company's interests at Ketchum, the company had expended fully $1,500,000 without realizing a dollar of cash profit. This was due to exteusive investments. Major Hyndman saw that the continuation of that state of affairs would be suicidal and he determined to lease a number of the properties to the miners. The results have been very gratifying.

The lessees are now operating seven of the company's mines. They pay a stipulated royalty and, even at the present depressed price of silver and lead make fair wages, while Major Hyndman makes regular remittances to the company, representing a snug little sum each year in excess of Mayor Hyndman's salary and other expenses. Only the richest ore is shipped. Major Hyndman says he shipped 300 tons of concentrates for the lessees this year.

MINING LEGISLATION.—The *Busy Bee* of Albion, Idaho, reports a meeting of miners at that place at which a committee was appointed to prepare resolutions on the subject of mining legislation. The *Bee* says: "The principal feature of the discussion at the meeting was the easy, go-as-you-please law of location. Under the present and existing laws a man, or a number of men, can stake off and locate the whole country, no speculations, and can hold it a year and the fractional year in which the location is made, without doing a tap of work, and we are sure without producing or developing any appreciable advantage or good result to the country, but on the other hand with the marked and perceptible disadvantage of retarding any measure looking to a speedy development of our mineral area. The present laws only protect the speculator, with the result of keeping out persons who might otherwise come in and do something. In this direction the Colorado law is looked upon with much favor, and it is highly probable the resolutions committee will recommend some such law for our State. There, before a locator can even record a claim, he must sink a shaft on the ledge ten feet deep, representing an hundred dollars worth of work, and had we the same law here it would certainly work to a great advantage to the country.

THE 'FRISCO MINE.—At the 'Frisco mine where the mill was blown up during the strike of two years ago, the wrecked mill has been replaced by a large structure and capacity increased from 150 tons per day to 400. The mine employs altogether about 145 men, and is still worked by tunnels. The upper two have been stripped of ore and the present work is on tunnel No. 3 which is 300 feet below No. 1. The outcropping of the mine when first discovered were small. In tunnel No. 1 the vein showed three feet of good ore; tunnel No. 2 increased the vein to about six feet, and now in tunnel No. 3 it shows an average width of about sixteen feet, though in some cases it widens out to forty feet. The present tunnel was run in 1,052 feet before the vein was found. Along this they have drifted 800 feet. The mine is operated by water power entirely, having developed 150 horse power. Compressed air drills will be used in sinking the shaft. The ore is conducted out of the mine by mule trains, each train load being about fifty tons. The mill is running at full capacity and ships from 1,200 to 1,500 tons of concentrates every month. The mine will run all winter unless some emergency arrives to change the present arrangements.

MONTANA.

The citizens of Granite county are endeavoring to secure the erection of a smelter in the vicinity of Philipsburg to treat the ore of mining camps in Missoula, Deer Lodge and Granite counties.

Several Bozeman citizens are interested in the coal fields on Trail creek, in southeastern Montana. It is reported that for many square miles the coal lies not to exceed three feet below the surface and that it is of high grade. All that is needed is railroad facilities for the development of this section.

It is almost impossible to sink a shaft or run a tunnel for any considerable distance on the mountain west of Main street in Marysville, says the *Mountaineer*, without encountering a pay shoot, and yet most of this land is open to location. A man with a few thousand dollars might here find a profitable investment and strike a bonanza.

The Marysville *Mountaineer* says that the Monitor mine, with Messrs. McKillican and Boyer Bros. proprietors, is showing up finely and that the new mill is kept steadily at work on rich ore. This is the property the Boston tenderfoot was afraid to purchase. He could have made $10,000 by purchasing the property and holding the same a few months.

The output of the placer mines owned by the La Crosse Bros. and Barrett on Cedar creek, in Missoula county, is said to have been $26,000 in gold dust.

The Harvey district, in the vicinity of Philipsburg, is attracting considerable attention. It is a gold hearing district, and some of the mines are reported very rich. Some of the quartz taken from the mines runs from $5 to $500 per ton.

J. E. Morse has sold the Midnight mine to A. V. Clark, representing St. Louis parties, says the Dillon *Examiner*. It is understood that work will begin at an early date and the mine be fully developed, and in all probability a mill will he built next spring. The price paid was $11,500.

The San Martina Mining Company, owning mines near Martina, in Missoula county, during the past year has constructed a five-stamp water power mill, built a hoarding house and made many other improvements. The mill was started up in October and has been running ever since.

MEXICO.

SONORA.—C. B. Serventi, of Altar has a property twelve miles from the coast: the water they use is brought twenty-one miles. The ore is packed on burros twenty-five miles to be worked. It is worked in steam arrastras, and pays to work it even under such disadvantages. It is a gold property, free milling and rich. The ore that is sorted and worked runs $200 to $300 to the ton. The average of the mine is at least $30.

Sinking has been done to a depth of 200 feet for water. The bottom of the well is as dry as an Arizona mesa as yet. The owners will not sink farther for water at present. Water is packed into camp in small kegs and brings one peso a keg.

The mine comprises two claims, one of 800 metres in length, the other of the regulation 600 metres. The mining laws of Mexico allow the discoverers of new districts an extra 200 metres for bringing out new fields. One of the two mines being the pioneer of the district it is larger than the regulation claim. The owner is now negotiating with San Francisco parties to sell the property. All arrangements were once made for the sale of the mines to Denver parties. That, however, was about the time of the late panic, and owing to that the sale fell through.

NEVADA.

ESMERALDA CO.—Walker Lake *Bulletin:* Col. W. J. Sutherland, Managing Direetor of the Holmes Company, arrived in Hawthorne Friday and took a special from here to Candelaria. On his return, Sunday, Mr Sutherland said that he was testing the ore and tailings of the Holmes mine with a view to working the same on a large scale by a new leaching process. Thos. Reed, the well-known mineralogist, is at present making tests, and on his report depends the action of the company. Mr. Sutherland said he thought work would begin within a month.

There are half a million tons of tailings at Belleville and Candelaria; and a plant will have to be built to do the work on a large scale. There are also large bodies of ore in the mine which will no doubt pay well if treated by the new process.

This is a gleam of light through the dark clouds that have overhung Candelaria since the big mines closed, and it is the earnest hope of everybody that the tests now being made will prove satisfactory.

The report published in the *Enterprise* that Mr. Sutherland is negotiating a sale of Ed Brown's mine at Silver Star is a fairy tale. He did not visit Star district, but he has arranged with Mr. Reid to go there and inspect the mines in his interest.

A GOLD MINE.—Mr. E. B. Coleman has recently acquired for an Eastern syndicate the property at the head of the Owyhee, about sixty miles north of Elko, consisting of some very rich free gold quartz veins. At a depth of thirty-five feet the veins have widened, but the average thickness thus far has been about three feet. A small vein of twelve inches has assayed as high as $1000. It will soon he determined whether the company shall erect only a small concentrating plant or put up a full reduction works. A force of men is now employed in developing the mine.

NEW MEXICO.

Record: R. B. Hunter of the Bucyrus Placer Company, operating in Merino valley, Colfax county, New Mexico, gives good reports of the past season's operations on the company's property which extends some six miles down Merino creek, near Elizabethtown. The working season, which begins about the first of April and runs to December 1st, is conducive of constant operation. Advantage of this fact was taken by the Bucyrus company during the season. A large Bucyrus amalgamator with a capacity of 1,000 yards daily has been used with such marked success that it is quite probable that another will he added this year. Mr. Hunter says that fully 95 per cent of the values were saved and there was absolutely no gold in the tailings. Mr. Hunter has mining interests in Central America and expects to operate on a profitable scale in that country next season. He anticipates a big year in gold mining for 1895 and says New Mexico will come to the front in a surprising manner.

OREGON.

AT WOLF CREEK.—According to reports brought in by one of the miners of Mount Reuben the chemical process for working refractory ores, which was being tested by Messrs. Beardsley and Wetherell on the Copper Stain mine on Mount Reuben, has proven a success. They have their three-feet pan in operation treating tailings. It is reported that as a result from less than forty-eight hours' run they cleaned up $600. The Star Mining Company will soon have their machinery in operation on the Star mine on Grave creek.

UTAH.

GOLD COIN DEVELOPMENT.—*Tribune:* The owners of the Gold Coin group of mines in the Mercur district have let a contract for one hundred feet of crosscut tunnel to open up their property. The work is to be begun at once and pushed to completion as rapidly as possible. As soon as the vein is encountered, general development work, looking to the ultimate erection of a cyanide mill, will be begun. The owners of the property are Messrs. H. T. Bragden, Quincy Smythe, Carr and other Denver parties.

WASHINGTON.

The Cedar Canyon mines, situated in the mountain regions of Steveus county, and on the slope of the range which reaches down into Spriug valley, are attracting attention. A Mr. Hall, who was the discoverer, has charge of the development and work on the mines, and the recent shipment of ore from the mines to Davenport has caused considerable comment to be made as to the richness of the district. The ore is of a carbonate nature, and runs to the value of about $500 per ton. There is about four feet of ledge, and the mine is very easily worked, and is also accessible to wagon transportation. The ore has to be hauled a distance of about forty miles then shipped to Tacoma for treatment.

The Old Dominion mine, near Colville, which has been working steadily on development work for the past six months, will make some very radical changes at an early date. It is the purpose of the management to put an additional force of men on the property for the purpose of extracting ore and to start up the concentrating works as soon as the whether will permit. Several properties surrounding the Old Dominion that have been bought up by the company will make liberal contributions of ore to the concentrating works when they start up.

It Does.

"Does Electricity Kill?" is the caption of an article going the rounds of the press. Sometimes.

TACOMA, Wash., Jan. 5.—Two thousand volts of electricity passed through Peter Peterson, day electrician at the city light station, this morning, instantly killing him. In making changes on the switchboard he grasped two plugs at the same time, his thumbs touching them too far up and on the non-insulated portion. There was a flash and he fell back dead. He had been in the employ of the company six years. His death is attributed to carelessness.

THE 999, on the N. Y. Central, is still the queen of all locomotives. Her run of 436½ miles in 425¾ minutes stands as a world's record, and her mile in thirty-two seconds has never been equaled in this or foreign countries. But it is more than probable that within the next few months the New York Central officials will order one of these records broken by another engine, and will then give the 999 an opportunity to enter into the record-breaking business again.

Coast Industrial Notes.

—E. Coleman has been elected president of the Pacific Rolling Mills, vice J. G. Fair deceased.

—Edward A Rix has been granted patents for his Phœnix drill in all the Australian colonies.

—An assessement of seven dollars per share has been levied on the capital stock of the San Francisco Tool Co.

—The Gila dam and reservoir, the "Wolfley ditch," in Arizona, has been bought by Charles Crowley of Los Angeles for $500,000.

—The Vancouver, B. C., miners will continue to work at the present low wages six months longer, the coal market being rated "gloomy and uncertain."

—H. D. Morris has lately moved into commodious quarters at 143-145 First street, and is furnishing considerable machinery to mining companies in Sierra and Amador counties.

—John McNamara has sued the city of Seattle for $15,000 for infringement of patent on a mining machine used in tunneling. The city denies that the machine in use is the same as the one patented by McNamara.

—Water from the Bull Run river was turned into the mains of Portland, Or., last week. The water is brought nearly forty miles from the Bull Run river, a mountain stream rising in the Cascades near Mount Hood. The plant cost the city over $2,000,000.

—The Point Defiance Railway has been sold at Tacoma to S. Z. Mitchell of Portland for $82,000, subject to several mortgages, aggregating over $200,000. The principal holders of the mortgages are C. S. Hinchman of Philadelphia and J. C. Lewis.

—The gas plant and the Commercial electric light plant, one owned and the other controlled by the Tacoma Light and Water Company, have been transferred to Seymour, Barto & Co., C. B. Hurley, and some eastern men who make a specialty of the gas business.

—G. A. Sachas, of Eugene, Or., who is the patentee of a hammerless shotgun, has established a shotgun factory in that city, which, the *Guard* says, is the only complete establishment of the kind west of the Mississippi river. He will employ ten men, and expects to make about fifty guns a week.

—The Sierra Valleys Railway Company has incorporated to construct and operate railroads in Washoe county, Nev., and in the counties of Sierra, Lassen and Plumas, Cal. The estimated length of the road is 100 miles. The directors are J. M. Platt, J. Elder, J. Flitlie, F. F. Ryer and W. S. Kittle. Capital stock $1,500,000.

—The Tillamook Electric Railway, Power and Light Co., of Tillamook, Or., has filed articles of incorporation; its object being to operate an electric railway from a point on the line of the Oregon Central railroad in Yamhill county at or near North Yamhill station, westerly, following the course of the North Yamhill river, the Nestucca, and the Tillamook rivers to the shore of Netarts bay in Tillamook county.

—Charles England, of Kelso, Wash., who is running a logging camp near Olequa, has a long chute, just one mile long, and when a log is placed in it at the top of the mountain, it reaches the bottom, plunging into the Olequa creek, in just fourteen seconds. The chute is a perfect one, as there never has been a case where one jumped the chute. The water at the mouth of the chute is of sufficient depth that the logs are not injured in striking the bottom of the stream.

—The new Sierra Valley railroad, which has been completed for a distance of twenty-three miles and is projected to cross the Sierras through Beckwith Pass, has been mortgaged to the Southern Pacific. Nevada papers think that the fact that the Southern Pacific is aiding the project indicates that corporation has secured control of the property, with the probable intention of abandoning the Central Pacific line across the Heaness Pass route during the winter season, thus avoiding blockades and the heavy cost of maintaining the long line of sheds across the snow belt on that route.

—The Southern Pacific Co. is figuring on supplanting its steam local service in Oakland, Alameda, Berkeley, etc., with electricity as a motive power. A year ago a contract was made out with a large Eastern company to put in the electric plant to run the local service. The papers were all ready to be signed when the reported invention of a German who had perfected a new and much more attractive system of electric motive power caused a delay. An agent was sent on to Germany to investigate the subject and to look into other systems in operation in Europe. Arrangements are now in progress for putting in a system of electric power, wherein the current or power is supplied from a slot between the rails, and overhead trolley wires will not be used. The new system will not only run for feeding the ferries, but for a street service as well. The cars will be somewhat larger than those running on the San Leandro line, and they will be run with two or three in a train. The ferry service will then be extended to Haywards and possibly extended to San Pablo. Electricity is a much cheaper and more expeditious method for short hauls such as are involved in the local service, than are the heavy steam trains. The company is anxious to obtain the latest inventions before making a change.

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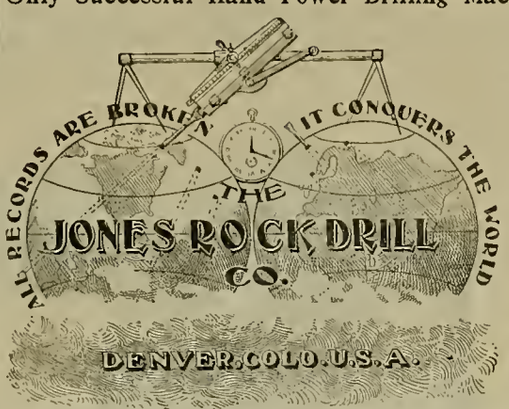

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Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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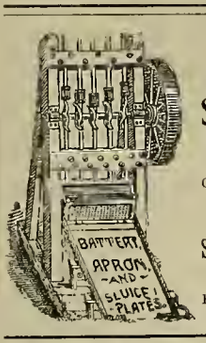

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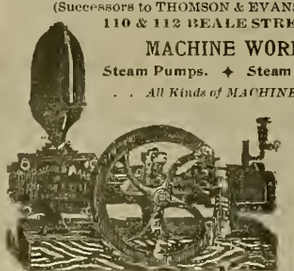

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Electrical Progress.

The Great Dynamos at Niagara.

Three of the euormous dynamos with which the Niagara Falls Power Company is to develop electricity have been completed, and are now being set up. The initial stage in the practical operation of that wonderful scheme, therefore, is elose at hand. In several respects besides their uueqnalled capacity — 5000-horse power each — these generators are unnsnal, not to say original. And while it is possible that a few months of service may reveal ways in which improvement can be made, these machines represeut the very latest and best ideas in electrical engineering. The caual which is to bring water to this great plant was long ago completed, as was also the tunnel (7000 feet in leugth) that serves as a tailrace. The wheelpit was ready last summer, and during the last four months the turbiues and penstocks have been put in place. Everything is in readiness, therefore, for the crowning task of installing the machinery here described.

Most dynamos are driven by a horizontal shaft. Those at Niagara have vertical shafts, reachiug down to the water wheels, 136 feet below. Although each wheel weighs about two tons, and the shaft (which is as big as an ocean steamship's) about seventy-five tons, yet the water is to be introduced in such a way as to carry this load, aud leave to the various bearings merely the duty of holding the mechanism in position. Again, it is customary in the American dynamo to have the outer set of magnets, whether they be two or a hundred in number, and constituting what is called the "field," remain statiouary; and the armature with its coils, in which the current is excited, rotates inside of the cluster. But at Niagara the conditions are reversed. The central portiou will be fixed, and the outer part will whirl about it. The first desigus adopted by the company were prepared by Professor George Forbes; but the company, before taking the contract to build, proposed certain modifications.

The field magnets, twelve in number, are attached to the inner face of a wrought-steel ring. Their pole-pieces are also of steel. The riug, which is about twelve feet in outside diameter, is both supported and revolved by a plate which stretches completely across it, which is shaped like a flattish cone and which is secured to the upper end of the shaft. In this roof are several openings, covered with small rouuded hoods, to admit air. Every one familiar with the arrangement of a dynamo knows that field magnets are uot permanent magnets, but electromagnets; that is, the iron cores derive their magnetism from a current flowing through coils of copper wire around them. In a direct-cnrreut dynamo, after the machine is started and the armature coils begin to develop electricity by induetion, some or all of this current is lead off into the field coils; and from that time onward the operation is very simple. A small amount of "residual" magnetism remains in the cores after the machine stops, and this is the germ relied upon to start with next time. But in dynamos designed like those of the Niagara plant to develop au alternating current, it is customary to use a separate exciting current, derived from an outside sonree, usually a small direct-current dynamo. At Niagara the exciting curreut is brought to the field magnet coils through sliding contacts (brushes and collecting rings).

Before referring more particularly to the armatures adopted for these machines, a word or two might be said about the "disc" pattern of armature. Thereiu one does uot see a lot of spools of copper wire, each with a separate core. Instead, there is a thick dise, on whose periphery are a lot of transverse furrows or slots, giving it to the careless observer the appearance of a cogwheel. A eoil consisting of a few turns wound over a rectangular form is then applied to the disc in such a way that one side of the sqnare will fit down into one slot, the opposite side into another slot a short distance away, and the remaining sides lie flat on the lateral surfaces of the disc. Each coil overlaps several others, and conseqnently includes as its core part of the metal forming another coil's core. Right here it may be remarked that the word "core" is also used to designate the whole disc without its coils. It will be seen that, however this arraugement may differ from the older ones, the essential idea is retained: A piece of soft iron is encircled by copper wire, and the pole of the eleetro-magnet thus created points outward, radially toward the field magnet past which it is to be moved by rotation. Each groove in the periphery of the disc contains the first end of one coil aud the further end of another. Sometimes what is called here a "coil" consists merely of two solid bars of copper, each in a different slot, and having their ends properly connected. For reasons which need uot be given, it is desirable to make those bars of several strands, lightly insulated from each other. Of conrse each bar is also insulated carefully from the one with which it is required to lie in the same slot. In the Niagara generators the armature is a horizontal ring, composed of thin plates of oxidized iron, lying one above another, and bound together by eight vertical bolts of uickel steel. There are 187 holes or slots in its periphery, aud two rectangular copper bars, insulated with mica, are fitted into each. Two kinds of counections are theu provided, one making coils out of the bars and the other merging the various coils together, not, however, into one, but into two systems, for these are "two-phase" dynamos. That is, they develop two alternatiug currents, one having its changes come a quarter of a pulsation behind those of the other for convenience iu operatiug the "two-phase" motors, which some of the customers are expected to use.

From the framework that sustains the armature there extend inward four arms to provide bearings for the shaft. The bushings of the beariugs are provided with zigzag grooves for oil, while the outer surface of the bushings have other grooves through which water may be circulated to keep them cool.

Some of the local consumers at Niagara will want a continuous current instead of an alternating one. Several novel machines to effect this conversion, besides transformers to lower the voltage to the desired degree, will therefore coustitute part of the equipment of the power house. Again, while the dynamos will deliver their output at 2000 volts, there has been talk of raising this to 5000, 10,000 or even 20,000, for ease of transmission to distant points; and other transformers will also be required for this work. Some of the details of the mode of distribution, though, are not yet fully determined.

The field magnets are to be whirled about the armature 250 times a minute, or four and one-sixth times a second. As a separate impulse is excited in the armature by each field magnet, the frequency of the alterations will be fifty to the second, giving twenty-five complete waves in that period of time. No commutators or collectors will be required in order to lead these currents off, since the armature and its coils are stationary.

As soon as the plant is in operation the Pittsburg Reduction Company, which has established works at Niagara for obtaining aluminum electrolytically, will be furnished with all the electricity it wishes.

The Carborundum Company will be the next customer served. But it is hoped at an early day to deliver a good supply in Buffalo, which city is preparing to celebrate the event with much formality and display. It is designed to include Lockport, Rochester, Syracuse and other large and small centers of population within the field of these benefits, eventually, besides furnishing electric light and power to industries to be established at Niagara, and operatiug boats on the Erie canal with the same agency. As the capacity of the outflow tunnel from the wheelpit will accommodate water enough to generate over 100,000 horse-power, it will be necessary only to install more turbines and dynamos to meet any demand up to that limit. But the same corporation controls rights on the Canadian side of the Falls, and is already taking preliminary steps toward the development of an even greater amount of power there than the American plant is adapted to yield.

Compared with the enormous amount of water going over the Falls, which is equivalent to something between seven and twelve million horse power, the portion taken for this enterprise is so small that it will probably make no perceptible difference with the appearance of the mighty cataract. Even in winter, when the accumulations of ice up in the rapids sometimes interfere with the supply on the American side, it is believed that gravitation would make good any artificial deficit due to the power company's consumption.

Direct Current Dynamos.

There exists in England a general and deeply rooted idea that direct current dynamos of very high potential are not at all practical. This unfavorable opinion is particularly strong in regard to the use of such machines for the transmission of power for any considerable distance—in fact, such a system is considered to be almost out of the question. The actual historical and practical facts are that the high potential direct current machines were more exteusively and successfully operated when the dynamo first came into general use about 1880 than any other type, either direct or alternate. Furthermore, their number and size have largely increased, and the voltage at which they can be practically worked has been steadily raised, until the public now have sixty-light dynamos as the staudard size of large machines generating about 3,000 volts and ten amperes. Arc dynamos of ninety-light capacity are also regularly made by several manufacturers, and 120 or even 125-light machines are built and used.

An Eastern syndicate is prosecuting a survey in Kern canyon, and a party of twenty men is blasting out a trail, beginning about fifteen miles northeast of Bakersfield, the intention being to spend $8000 or $10,000 in a preliminary survey to determine the feasibility of developing electrical power there. It is expected that the survey will be completed by February 1st. C. N. Beal is in charge of the project. The California combination of dear fuel and unlimited water power makes an inviting field in the mining districts for the utilization of mountain streams in furnishing electric power.

The phenomenon known as "electric sunstroke" is attracting attention by reason of its frequency among workmen employed in melting metals by the electric process. The intense voltaic arc between the carbon and the metal to be melted emits rays, producing a sensation similar to that of a burn on uncovered portions of the body. There is frequently great pain, sleeplessuess, and in some cases fever. The skin becomes copper-colored or bronzed, the eyesight is sometimes temporarily lost and followed by what is known as "yellow vision," with a seusation as of sand under the eyelids.

The German military authorities are trying a new arrangement of the electric light. An electric arc lamp of 5,000 or more candle power is suspended in the air from a captive balloon. The current is led to the lamp by an insulated wire or cable, and the light is reflected downwards to the ground. A large open space is thus illuminated, without lamp-posts, and the evolutions of a body of troops can take place by night without impediment.

A paper read before an institution of standing, but inadequately discussed, may often do more harm than good.—London Electrician.

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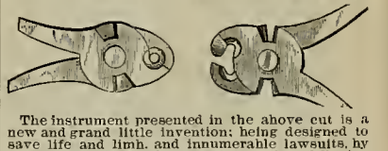

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A Titled Metallurgist.

The recent death of Lord Swansea ends the honorable career of a busy man who did much for mankind. He was on this coast last fall. The life and labors of this peer of the British realm contain an element of more than passing interest. He was what is sometimes in England termed a "laboring lord." For more than fifty years he worked with indomitable energy in the building up of one of the largest industrial enterprises on earth. The possessor of a title and vast wealth, there was little of the aristocrat about him. His friends were among the masses very largely; there were few among the thousands of men who labored on his great estates but admired and loved him. Lord Swansea was a man of genial nature and kindly heart. The poor in his borough were his especial eare. It is said that among the laboring classes he was the most popular peer in all the British realm.

Lord Swansea was born at Singleton, Wales, in 1821. He graduated at Eaton in 1842. The following year he took charge of the extensive business of Vivian & Sons, Liverpool. Three years later he assumed the management of his father's business at Swansea. The operations at that time were confined to copper smelting; but he developed the manufacture of spelter, or zinc, introducing an entirely new system and raising the production enormously. In 1846 Lord Swausea, theu plaiu Hussey Vivian, commenced the extraction of silver from copper by a process which he perfected. In 1850 he introdueed the Platner process of extracting gold. Five years later, under his direction, the great works at Swansea begau turning out nickel aud cobalt. In 1846 he undertook to deal with the extremely difficult problem of condensing copper smoke and produeing valuable products therefrom. His lahors in this respect were sueeessful in a marked degree. In order to utilize the sulphuric acid caused by the eondensation of copper smoke, Lord Swansea found it neeessary to erect alkali works, works for refining sulphuric acid, also superphosphate works. These were all novelties in their day.

The town of Swansea is the parent home of the smelting industries of the world. Lord Swansea was without doubt oue of the greatest metallurgists of the eentury; the study of metals and the methods of treating ore beeame a passion with him. There is not a mining eamp in America where his name is not familiarly associated with these subjects. He was a recognized authority upon the subjeets of mining; there was a time wheu most of the orc mined in any part of the world was sent to Swansea to be treated in the mammoth works which the ability and energy of this remarkable man praetically established.

Deep Snow.

The depth of snow on the high Sierras at this seasou of the year and after a heavy storm is almost incredible. Travellers through the mountains have observed with wonder shingles nailed upon the sides of trees from fifteen to twenty-five feet from the ground, and question whether the snow ever fell as deep as indicated by these shingles.

Mr. E. A. Halstead, who crossed the mountains many times for twelve successive years between Oroville and Quincy, says during the severe winter of four years ago snow fell to a depth of forty feet from Buekeye to the Toll Gate; that on one oeeasion the mail carrier, after a hard storm, crossed over the peak of the Buekeye House without seeing the building, although it reached a height of thirty-eight feet above the ground. The Letter Box hotel was so completely covered that it required thirty-two steps from the top of the snow down to the second-story window. For a distance of two or three miles in the vicinity of the Letter Box where the snow had drifted the banks were fully 100 feet deep. He notieed in one plaee where the wind had swept the snow from about the bole of a tree that it was fully ten feet down to one of the shingles to whieh we have alluded. He and others who were familiar with the snow that winter estimate that, had it beenmeasured as it fell, it would have reached a depth of at least 140 feet.—Oroville Register, Dec. 27th.

HORSE OWNERS should understand that their auimals are peeuliarly liable to iujury from contact with electrie currents. This is not due to the physical strueture of the horse, but to other causes, some of which are in a degree preveutable. The safety of a horse depends upon the skill of the blacksmith to some extent. The authority named points out that the shoes offer a large surface for contact and the nails eonduetors by which the current may enter the body, although the sole of the hoof itself is an insulator. The auimal's weight aids the contact, and a wet fetlock increases the danger. Blacksmiths, therefore, should not drive the nails to the "quiek" and the fetlocks should he trimmed.

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No. 8

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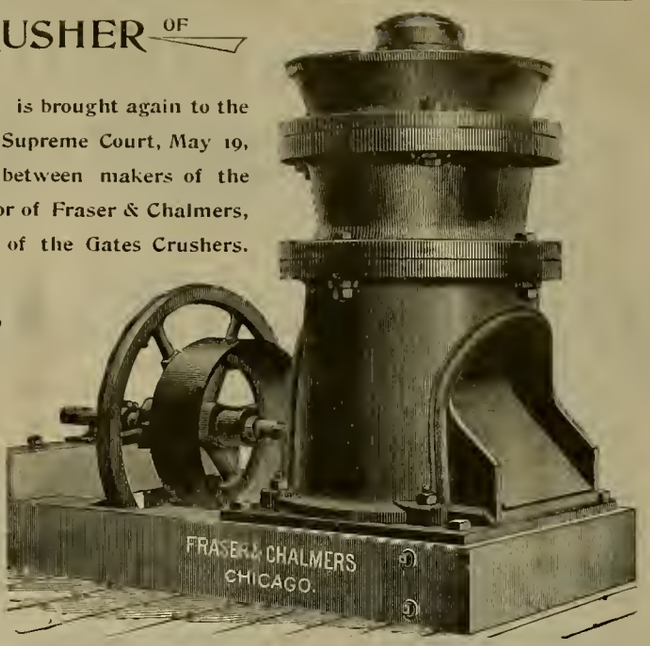

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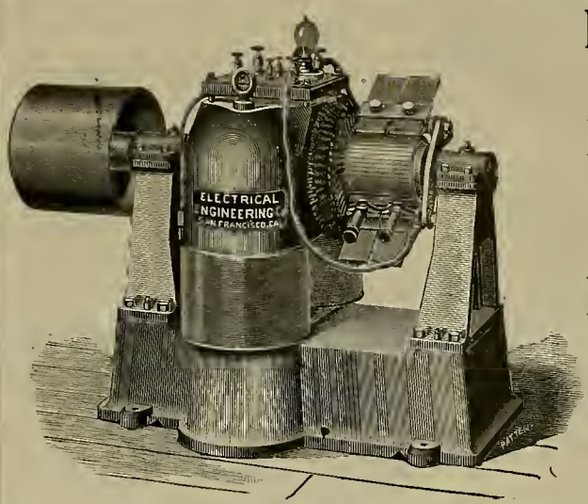

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Market Reports.

The Markets.

SAN FRANCISCO, Jan. 10, 1895.

The 60 mark has been reached during the week, in silver. Financiers in and out of Wall street are now giving serious consideration to the question of what would happen if Japan should lusist that China pay the war indemnity in gold or silver. As has already been announced, Japan proposes to make a demand upon China for an indemnity of something like 500,000,000 yen. The unit of account in Japan is the yen, of which there are three kinds—gold, silver and paper. The silver yen is about the size of the American standard dollar. It contains a trifle more silver, being composed of 416 grains, 900 fine, while the American dollar contains 412½ grains of like fineness. The gold yen is a very small fraction lighter than the American gold dollar. It contains 25½ grains of gold of 900 fine, while the American gold dollar is composed of 25.8 grains. The paper yen, which circulates only in Japan, occupies a place similar to our greenback and national bank currency. It is convertible into silver. But little is known outside of the empire in regard to the fiscal policy of that country. Prior to the present war with China the Empire of Japan had in circulation something like 24,000,000 paper yen, which were convertible into silver.

In addition to this the Bank of Japan had about 105,000,000 yens in paper in circulation, which was also convertible into silver. There was no uncovered paper in circulation in the Empire prior to 1893. Japan's system of coinage corresponds very closely to that of the United States, with the yen as the unit of account. The subsidiary coinage consists of the half yen, quarter yen, twentieth yen, with minor bronze coinage. The largest gold coinage is the five yen. Japan possesses gold and silver mines, which belong to the imperial house. They yield about $2,000,000 annually. It is now the belief of those who have been watching the struggle between the two nations—China and Japan—that the latter will exact the indemnity above alluded to in gold. In such an event it does not require a prophet to tell what will occur. To exact five or six hundred million yen in gold from China, a nation that is on a silver hasis, means rough sailing for nearly every nation in existence that is on a gold hasis. The nation that would first feel the effects of such a demand would he the United States.

New York Prices.

NEW YORK, Jan. 10.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.
Friday	27½	59¾	9 50	3 00
Saturday	27½	59¾	9 40	3 00
Monday	27½	59⅞	....	.....
Tuesday	27⅝	59¾	....	.....
Wednesday	27⅝	60	....	.....
Thursday	27½	59¾	....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	12¼c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.89½
Refined Silver, per ounce	59¾
Mexican Dollars, nominal	50½@51

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	5 50
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	17	@	—
LEAD.			
Pig	—	@	3 95
Bar	—	@	4 50
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 25
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do, "		"	1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			5 50
Cannel			8 00
Egg, bard			12 00
Wallsend			7 00
Scotch Splint			7 50
Brymbo			7 50
West Hartley			8 00
TO ARRIVE—PER TON.			
Australian	5 25	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 62½	@	— —
Cardiff	6 87½	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 50	@	— —
Egg, hard	9 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

On the first inst. the valuation of foreign coins was fixed as follows by the director of the Mint:

	Jan. 1.
Boliviano of Bolivia	$0 45.5
Peso, Central American States	45.5
Shanghai Tael of China	67.3
Haikwan Tael of China	74.9
Peso of Colombia	45.5
Sucre of Ecuador	45.5
Rupee of India	21.6
Yen of Japan	49.1
Dollar of Mexico	49.5
Sol of Peru	45.5
Ruble of Russia	36.4
Mahbub of Tripoli	41.1

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied,	Delinq't and Sale.	Secretary.
Alta S M Co, Nev	48	10c	Nov 28,	Jan 3, Jan 24	J E Jacobus, 309 Montgomery
Bulwer Con M Co, Cal	10	5c	Dec 11,	Jan 16, Feb 15	J E Jacobus, 309 Montgomery
Golden Eagle M Co, Nev	1	15c	Jan 8,	Feb 28, Mar 4	E B Holmes, 309 Montgomery
Hale & Norcross, Nev	106	25c	Nov 23,	Dec 29, Jan 23	A B Thompson, 309 Montgomery
Mexican G & S M Co, Nev	51	25c	Dec 5,	Jan 8, Jan 29	C E Elliot, 309 Montgomery
Mono G M Co, Cal	34	15c	Nov 19,	Dec 27, Jan 21	M E Willis, 309 Montgomery
Opbir S M Co, Nevada	64	25c	Dec 10,	Jan 14, Feb 4	R B Holmes, 309 Montgomery
Potosi M Co, Nevada	43	25c	Dec 11,	Jan 14, Feb 5	C E Elliot, 309 Montgomery
Reed M & M Co, Nev	1	2c	Dec 31,	Feb 11, April 3	John H Isham, room 33, Mills Bldg.
Savage M Co, Nev	85	20c	Dec 4,	Jan 7, Jan 28	E B Holmes, 309 Montgomery
Silver Hill, Nev	34	5c	Nov 19,	Dec 26, Jan 16	D C Bates, 309 Montgomery
Union Con S M Co, Nev	50	20c	Nov 22,	Dec 27, Jan 16	C C Harvey, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Sierra Nevada M Co, Nev	E L Parker, 309 Montgomery	Jan 16

Mining Share Market.

SAN FRANCISCO, Jan. 10, 1895.

There was a strong market for Comstock shares during the week. The Con. Cal. & Va. declared a regular monthly dividend of 25 cents per share, payable next Tuesday. The annual election of officers of the San Francisco Stock Exchange takes place next Monday. The following nominations have been made: George I. Ives, president; A. B. Ruggles, vice-president; O. V. Walker, chairman; F. W. Hadley, secretary; George T. Marye Jr., treasurer; committee on membership, George C. Hickox, James Paterson, H. H. Shinn, Joseph B. Dyer, Charles H. Stoutenhorough, Charles D. Laing and J. B. Fitch.

The following shows the cash balances of some of the mining companies on the 7th inst.:

Alpha	$8,172	Julia	$96
Alta	3,118	Kentuck	2,843
Andes	9,254	Lady Wash'n	2,625
Belcher	2,816	Mono	3,690
Best & Belcher	20,722	Mexican	629
Bullion	5,436	Navajo	202
Bodie	17,066	Nevada Queen	495
Caledonia	3,875	Occidental	752
Challenge	1,241	Ophir	512
Chollar	8,458	Overman	9,161
Con. Imperial	1,335	Potosi	1,810
Confidence	1,323	Savage	1,123
Con. New York	1,556	Scorpion	1,352
Con. Cal.	160,607	Seg. Belcher	1,725
Crown Point	662	Silver Hill	1,625
E. Sierra Nevada	238	Sierra Nevada	5,892
Exchequer	2,998	Standard Con	46,362
Gould & Curry	3,329	Syndicate	936
Grand Prize	1,026	Union Con	18,375
Hale & Norcross	25,726	Utah	3,053
Justice	542		

The indebtedness of other companies on that date is reported as follows:

Commonwealth	$16,247	Mexican	$1,000
North Belle Isle	442	Occidental	550
N. Commonwealth	3,263		

The following illustrates the changes of the week:

Mines.	3	10
Alpha	$ 12	$ 10
Alta Consolidated	....	50
Andes	36	37
Belcher	68	61
Best & Belcher	97	1 10
Bodie	80	80
Bullion	23	.....
Challenge	....	42
Chollar	52	46
Confidence	85	81
Consolidated California and Virginia	3 80	3 95
Consolidated New York	....	.....
Crown Point	70	69
Excbequer	....	.....
Gould & Curry	42	44
Hale & Norcross	1 15	1 10
Justice	24	27
Mexican	64	1 10
Ophir	1 60	2 05
Overman	22	21
Potosi	39	35
Savage	27	.....
Sierra Nevada	55	68
Union	.....	66
Utah	....	06
Yellow Jacket	42	68

San Francisco Stock Board Sales.

SAN FRANCISCO, Jan. 10, 1895.

9:30 A. M. SESSION.

300	Alta	47	100		1 10
150	Andes	37	200	Justice	27
300	Belcher	58	155	Kentuck	05
100	Best & Belcher	1 00	100	Mexican	99
150		1 05	50		1 00
200	Bulwer	09	100	L. Wash	07
100	Challenge	42	900	Ophir	1 95
100	Chollar	46	550	Overman	20
100	Con Cal & Va	3 80	400	Potosi	35
50	Confidence	79	200	S. B. & M	18
225	Con. Imperial	01	100	Sierra Nevada	65
200	Crown Point	63	300	Yellow Jacket	64
100	Hale & Norcross	1 05			

SECOND SESSION—2:30 P. M.

100	Alpha	10	300	Kentuck	07
300	Alta	50	150	Mexican	1 05
400		49	300		1 10
200	Belcher	61	400	Ophir	2 05
500	Best & Belcher	1 05	200	Overman	21
100		1 10	300	Potosi	33
50	Bodie	83	100		34
50	C. C. V	3 90	300	Silver Hill	06
350		3 95	200	Sierra Nevada	67
100	Crown Point	69	200		68
50	Confidence	80	200	Union	65
50		81	300		66
200	G & C	44	200	Utah	06
100	Hale & Norcross	1 10	300	Yellow Jacket	68
300	Justice	26	50		67

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JANUARY 1, 1895.

531,990.—BICYCLE CANOPY—M. W. Armstrong, Los Angeles, Cal.

531,885.—BALING PRESS—H. Bailey, Willamina, Or.

531,779.—CARBURETOR—E. R. Cook, Sacramento, Cal.

531,780.—CARBURETOR—E. R. Cook, Sacramento, Cal.

531,791.—METALLIC BUNG—M. Fischer, S. F.

531,918.—BICYCLE—J. Forrest, Medical Lake, Or.

531,930.—CAR—C. S. Hardy, San Diego, Cal.

531,696.—ERASER—C. R. Pechin, S. F.

531,857.—FLOUR SCOOP—M. E. Peterson, Igo, Cal.

531,807.—GAS ENGINE STARTER—J. W. Raymond, S. F.

532,013.—FURNACE—A. Ropp, S. F.

531,650.—TELEPHONE INDICATOR—Sabin & Hampton, S. F.

531,812.—LABEL MANIPULATOR—J. Stites, Salem, Or.

531,815.—CLOTHES DRIER—Geo. Wade, San Diego.

531,818.—VOTING MACHINE—H. Weber, Temescal, Cal.

531,672.—VEHICLE BRAKE—G. W. Wise, Warner Lake, Or.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

METALLIC BUSHING.—Maximillian Fischer, San Francisco, Cal. No. 531,791. Dated Jan. 1, 1895. This device consists of a hung hushing, having on its inner edge lugs for engaging the jaws of an insertable wrench, whereby the bushing may be easily removed. The wrench has expansible and contractable jaws adapted to enter into and engage the lugs of the hushing, to unscrew it, and it has also a threaded stem for engaging and screwing the hushing into place. There is also a protecting plate to lie upon the bung stave about the bung hole. The disadvantage of the ordinary hung is that the hole in the stave being large, it weakens the stave in the absence of a protecting plate, and the bung hole is injured hy the rolling around of the keg, its pressure against its neighbor, and the rough handling it receives in general. Another disadvantage is the impossihility of removing the ordiuary bushing without breaking the stave. This invention remedies these objections and disadvantages by providing a bung hushing which can hoth be inserted and removed with facility, and by providing a protecting plate for the hung stave.

ROASTING FURNACE. — Alfred Ropp, San Francisco, Cal. No. 532,013. Dated Jan. 1, 1895. This invention relates to improvements in furnaces for roasting ores. It consists of a roasting chamher having an essentially horizontal hearth, a central longitudinal truck or car chamber exterior to the roasting chamber, and connected therewith by a narrow longitudinal slot, a car or truck, a means for impelling the same in the car chamber, a frame projecting through the slot into the roasting chamher, and a rake or rabble connected with said arm so that it will rake the material on the hearth at both sides of the slot. A cahle is connected with the car, and, passing around direction pulleys exterior to the furnace and the car chamher, acts to first move the car through the chamher with the rakes traveling through the roasting chamber, then carries it around exterior to the furnace, and again introduces it into the chamber at the opposite end. In conjunction with this apparatus are automatically operated doors which open to allow the passage of the car and rakes and close after such passage, and a mechanism by which the ore is fed into the furnace as fast as needed.

VOTING APPARATUS.— H. Weher, North Temescal. No. 531,818. Dated Jan. 1, 1895. This invention relates to an apparatus which is designed for the casting and recording of votes. It consists of a tahle having independent slots for the reception of disks, each of which represents a vote; independent receivers situated heneath each of the slots; chamhered guard hars adapted to receive the disks and direct them into their respective slots, and movable stops hy which the disks are supported and prevented from falling into the receivers, and a mechanism hy which the stops are removod after all the disks are deposited to allow the latter to fall simultaneously into the receivers. Guard covers are made to slide over the other slots for the same office, so that but one vote can he cast for each office, and suitable mechanism is employed for operating the stop plates to allow the disks to fall when all have been deposited. An indicating disk is connected with a mechanism to show how many votes have been deposited, and the disks are received into tuhular chamhered receivers having numhers to indicate the number of disks and votes in each of the receivers.

MINING

DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE Circular, stating subject you wish to study. to **The Correspondence School of Mines, Scranton, Pa.**

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Mello & Costa, in the Spring Valley mine, near Cherokee, Butte Co., to deposit tailings on flat ground; from H. E. Picket, in the Kentucky Flat mine, near Georgetown, El Dorado Co., to deposit tailings behind a dam in North Otter creek; from Wm. Johnson, in his mine near Volcano, Amador Co., to deposit tailings behind a dam in Clapboard gulch; from El Dorado Water and Deep Gravel Mining Co., in the Henrietta mine, near Placerville, El Dorado Co., to deposit tailings behind a dam in a dry ravine; from Leroy Hedge, in his mine near Brownsville, Yuba Co., to deposit tailings behind a dam in a ravine; from Rolland & Vanderburg, in the Epley mine, near Placerville, El Dorado Co., to deposit tailings behind a dam in a ravine; from the York Mining Co., in its mine near Brownsville, Yuba Co., to deposit tailings behind a dam in a ravine; from Hancock & Daly, in the Last Chance mine, near Placerville, El Dorado Co., to deposit tailings behind a dam in a ravine; from Goodman Bros. and Goodman & Bund, in their mines near Volcano, Amador Co., to deposit tailings behind a dam in Ashland creek; from Hadley & Bolles, in the 49 Flat mine, near Volcano, Amador Co., to impound tailings behind a dam in 49 gulch; and from G. A. Melnecke et al., in the Fine Gold mine, near Vallicita, Calaveras Co., to impound tailings behind dams in a dry ravine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Jan. 14, 1895, at 1:30 P. M.

Notice of Assessment.

REED MILL AND MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Ferguson Mining District, Helene, Lincoln County, Nevada.

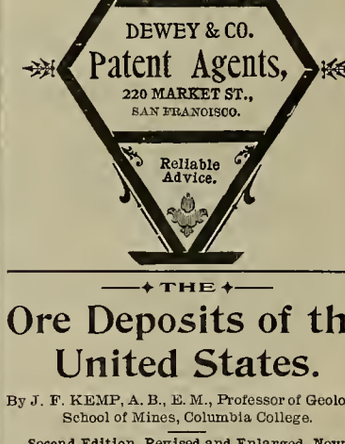
Notice is hereby given that at a meeting of the Board of Directors, held on the 31st day of December, 1894, an assessment (No. 1) of two (2) cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 33, tenth floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 3d day of April, 1895, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

By order of the Board of Directors.

JOHN H. ISHAM, Secretary.

Office, Room 33, tenth floor, Mills Building, San Francisco, California.



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A practical review of tbe ore deposits of this country. A valuable addition to up-to-date mining literature, of value to the Pacific coast. Sent postpaid upon receipt of price, $4.00. Address

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220 Market Street, San Francisco. Cal.

DIVIDEND NOTICE.

THE GERMAN SAVINGS AND LOAN SOCIETY

526 California Street.

For the half year ending December 31, 1894, a dividend has been declared at the rate of five (5) per cent per annum on Term Deposits, and four and one-sixth (4 1-6) per cent per annum on Ordinary Deposits, payable on and after WEDNESDAY, January 2, 1895.

GEO. TOURNY, Secretary.

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An Unwise Law.

The county clerk has recorded nearly 700 lodes upon which annual work has not been done. This represents a loss to the laboring miners of nearly $70,000, as fully sixty per cent of those who took advantage of the law are non-residents and amply able to pay for the work, while a majority of the remaining forty per cent were also able to have the work done. The law is against every interest in mining so far as Clear Creek county is concerned. It prevents the employment of labor when the miner is in the most need of it, as well as the development of lodes and the finding of paying ore bodies.—Georgetown Courier.

THE Geographical Society of the Pacific will hold its annual election for directors and councillors January 15th. The paper promised by the Hon. Jeremiah Lynch, on the recent discoveries in Egypt, is not yet completed for the society. We learn that Professor Schaeberle, the well-known astronomer of the Lick Observatory, is also expected to address the members at an early date.

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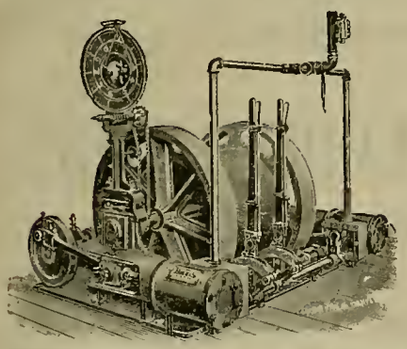

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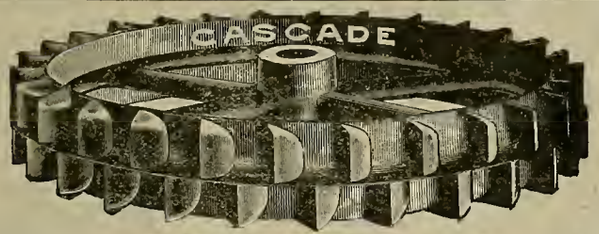

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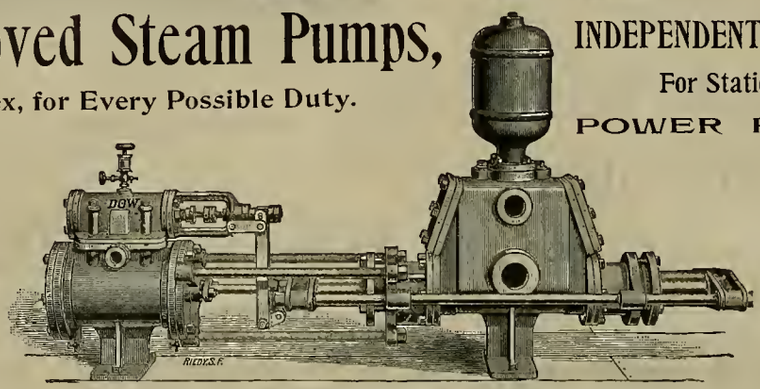

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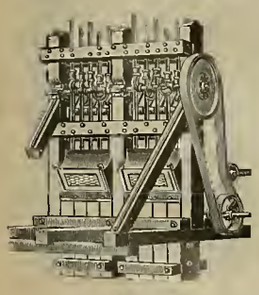

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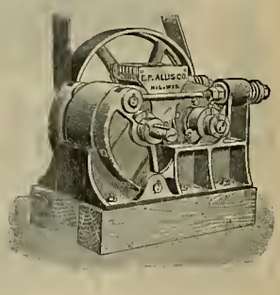

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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 3.

SAN FRANCISCO, SATURDAY, JANUARY 19, 1895.

THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

CALIFORNIA STATE LIBRARY

Mining Reports and Mine Salting.*

NUMBER II.

By WALTER McDERMOTT.

Mine Salting.—There are all degrees of "fixing a mine"—from the legitimate showing of its best features by not taking out all the rich ore before offering for sale, or by varying degrees of skulduggery up to the palpable salting of mines, dumps and expert's samples. In the less illegitimate stages much can be done, and very frequently is done, in the way of a judicious stoping of faces in good ore, and by the observing of a discreet silence as to past weaknesses and irregularities of the ore deposits. In such cases it is simply the ordinary commercial position of "let the buyer beware," and the expert has to show by his report if he has experience, observation and sense enough to form a sound judgment as to value.

In a mine which is thus carefully prepared for selling, it is not at all uncommon for the owner to go beyond the legitimate limit already indicated, and to misrepresent facts by filling up or concealing old workings which would, if examined, produce an unfavorable impression. The next step in the downward path which leads to a hotter place (but in the meantime also sometimes to affluence) is the scooping out of the inside of apparently solid blocks of good ground by openings afterward filled up or timbered over. Some of the most experienced mining men and engineers have fallen victims to this and the previously described course of conduct, while some have just escaped being caught by a mere accidental indication of the fraud, or by "peaching" of some miner who helped in the work and had not been squared. Naturally the danger from the sources mentioned is much less in new mines of limited extent than in old mines extensively developed. In a mine which has been worked for some time the visiting engineer is at a great disadvantage as compared with the men who have worked in it for years, and perhaps devoted their greatest skill to making not only a good record, but to concealing the exhaustion which is approaching. It happens occasionally, also, that the owners complete their work by "picking the eyes out of the mine" in the interval between the expert's report and the turning over of the property to the purchasers. The richer the nature of the pay ore in the mine the greater the danger from this piece of rascality, which needs specially providing against in the terms of purchase and by other precautions.

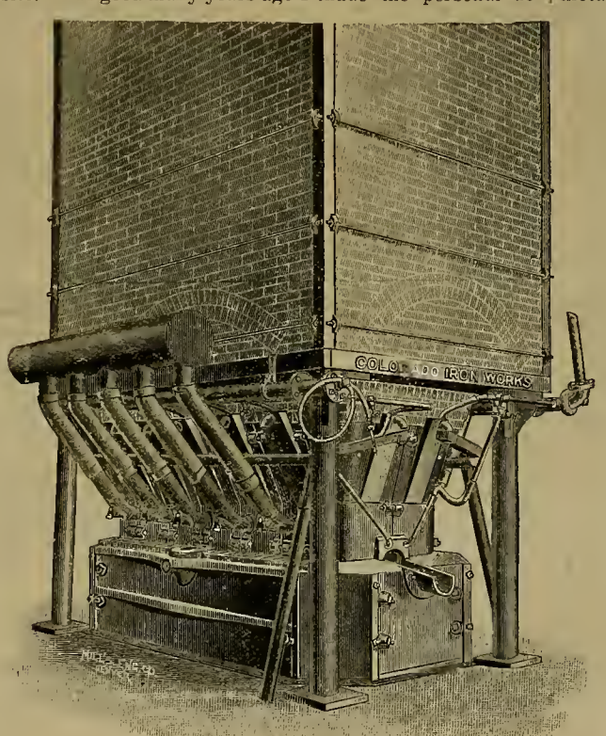
The above mentioned very real and not uncommon dangers, against which the engineer has to guard, are not, however, "salting" in its proper and technical sense, which is generally understood as covering any interference with the expert's chance of arriving at a true estimate of the value of ore. The salting may be done on the ore before the expert's arrival, or during his sampling, or on his samples when taken, or while panning or assaying.

Although cases are well known of faces in a mine being salted with such success as to catch the unwary, this form of salting is usually too difficult to carry out, and too superficial in character to offer much chance of catching an old bird. With ore dumps and alluvial deposits it can be done with better chances of success, but is naturally of an expensive nature if carried out on a really systematic plan. Cases are on record of successful salting of alluvial ground with precious stones as well as with gold, and the expert must clearly be on the watch against this, when circumstances allow of the possibility of its occurrence. With ore dumps it is often very easy to arrange a veneering of good ore over a very large pile of poor or barren rock, and then when the ingenious gentleman who takes samples "at random" comes along he will be sure to obtain a gratifying result.

A good many years ago I made the personal acquaintance of a prepared property on Lake Superior. It was a home-made tin mine. There had been rumors of valuable discoveries of tin ore on the north shore, where I was then living; and late one autumn an expedition from the United States went to report on it, taking an experienced Cornish mining captain for the necessary technical knowledge. A very glowing report was issued, and a company formed; rich samples were exhibited, and some tin run out of them and melted into spoons, which were presented to the fortunate shareholders. At that time the north shore was inaccessible for six months, except by a tramp of 200 miles on snow shoes to where I was, or 359 miles to the tin property, so the excitement grew during the winter, from the enchantment which distance lends. The report and the news of the excitement reached us in course of mail, and I was sent with an expedition and a land surveyor to report on the properties and take up land adjoining before navigation opened, and before any one else could reach the spot, which needed only 150 miles of snow shoeing for us. A good deal of ingenuity and work had been expended in making a tin vein, and a town

(Continued on page 38.)

* Paper read on Dec. 19, 1894, at the meeting of the Institute of Mining and Metallurgy.



SILVER-LEAD SMELTING FURNACE.

Silver-Lead Smelting Furnaces.

The accompanying cut was made from a photograph of one of the Omaha & Grant Smeltiug & Refining Company's latest furnaces in their Denver works, and is similar in important points to the silver-lead smelting furnace of to-day in the most successful equipments.

The furnace now in general use, as illustrated, bears little resemblance to that of sixteen years ago, when water-jacket furnace smelting was in its infancy in the silver mining regions of the Rocky Mountains, and is the outgrowth of the experience of practical metallurgists in charge of great smeltiug establishments built, owned and operated by practical business men.

The early furnaces were much smaller than now, and were usually circular in form, though not always so. They were confined pretty closely to the smelting of carbonate ores. Smelting grew quickly into a very profitable business, and the number of furnaces increased rapidily. Coincident with this increase of smelting capacity came a decrease in the output of strictly carbonate ores, and it became necessary to adapt the smelting furnaces to the treatment of other ores than the carbonates, which involved the use of roasting furnaces for sulphide ores, and may modifications in the detail of construction of the smelting furnaces, and a very great increase in size and consequence capacity, producing a corresponding economy in cost of ore reduction.

The Colorado Iron Works of Denver, Colorado, have made a specialty of the construction and erection of smelting works for the last fifteen years. They built the furnaces of the Omaha & Grant Smelting & Refining Co., of Denver and others.

A LARGE NUMBER of letters is daily received at this office makiug inquiry regarding mining sections, the purchase of machinery, the relative value of different processes, existing mining laws, assaying, etc., to which answers, so far as possible, are sent. Of late there are an unusual number of inquiries regarding aluminum. The matter is mentioned here to suggest that there is little use in sending samples of clay as illustrative of the presence and supposed value of the aluminum in it. Every clay bank is an aluminum deposit, hut not available or of practical value under existing conditions. There is a good deal of misinformation and some humbug about this matter. At preseut the bauxites and cryolites are the only paying sources of the light metal, and, despite the numerous "processes" announced, no one should build very high hopes on the possession of an ordinary clay bank regarding the aluminum it contains. Elsewhere is presented an article on the manufacture of aluminum by the Hall electric process.

RECENTLY it was stated in these columns that the best degree of puhlic policy required no more such "suspension of assessment" laws as those enacted in '93 and '94. This opinion is emphasized. Indeed, it would be better to so amend or interpret existing law as to put into practical effect what is manifestly true—that the working of a mine by its owners is a puhlic duty.

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J. F. HALLORAN.....General Manager

San Francisco, January 19, 1895.

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THERE is a noticeable preseut difference between the lethargy of the miuing stock market and the activity in actual mining operations.

REGARDING the disposition of stamps and cam shafts it may be said that if the stamps are allowed to rise and fall in regular succession from one end of the battery to the other, the material is apt to accumulate at one end, and the effective duty of the stamps thereby dimiuished. The order must, therefore, be varied. In a five-stamp battery a common arrangement is to let fall first the middle stamp, then the end stamp on the right, then the second stamp on the left, then the second stamp on the right, and, finally, the end stamp ou the left. The order in which the stamps are to fall being determined, it is carried into effect by fixing the cams ou the shaft iu such position that each cam, by the revolution of the shaft, will lift its respective stamp at the desired momeut. For this purpose the key seats cut in the hub of the cam must be determined with care: one common key seat beiug cut iu the cam shaft, when the desired position of any given cam has been determined, the key seat on the hub is cut to correspond with that of the shaft.

JIM WARDNER, who recently returned from South Africa, says that while there he spent a whole day examining the Crown Reef mine, and that superintendent Webber assured him that he had enough gold ore blocked out "to run that 240-stamp mill 150 years, and crush four tous per day to the stamp." Possibly. If so, that is cousiderable ore. Allowing that it runs $10 to the tou, that foots up 54,750,000 tous of ore, aggregating $547,500,000. Mr. Wardner, who, since the discovery of Mr. Webber and the Crown Reef and the tidy little block of ore referred to, has been visiting Colorado, says, writing from Leadville: "I saw more ore blocked out in the Little Johnny thau in the Crown Reef. The Little Johnny will go from $50 to $400." Possibly, also. Allowing $200 a tou for the alleged amount of ore Mr. W. says he saw in the Little Johnny, then that mine will turu out $10,950,000,000! It aud the Crown Reef will together produce about eleveu thousand million dollars. The eutire present total of gold on hand in the world is about four thousand millious. Sober consideration of the figures must lead to the couclusion that these two miues will occasion a readjustment of existiug financial couditions, or else Mr. Wardner or Mr. Webber or one or two other people must be mistaken. Probably the latter.

Not Proven.

The notice of this journal is weekly directed to novel theories and hypotheses in various fields, and while in many of them the ingenuity of the argumeut is alone deserving of commendation, in some the assertions challenge serious recognition and extended uotice.

Science, which is simply organized knowledge, has nothing fixed, traditionary or rigid about it. It is as elastic as the atmosphere, and as iconoclastic as the most zealous of image-breakers. Nothing is sanctified, nothiug definitely placed or displaced. It requires only proved results, the proof being of a uature satisfying intelligent minds.

Proof, absolute demonstration, accurate showing of fact, alone secures permaneuce or continued recognitiou. Where these are lacking the cleverest hypothesis, the most ingenious theory, falls, unsupported.

Mr. E. W. Keeler of this city at cousiderable length cites and paraphrases what is styled "a new system of philosophy," the result of much mental effort ou the part of Mr. S. J. Silverstein. The gentleman asserts that "there never was such a force as the force of attraction; that all the laws induced from this law of gravitation are utterly without foundation, and that Kepler's laws not only cannot be explained by Newton's law, but that those very Newton's laws serve as proof against it."

The hitherto general acceptance of Newton's deductions collides with Mr. S.'s argument, which is that there is what he terms a "centrality of motion;" that "motion is actually inherent in the planets themselves as in every substance or body existing in the universe; that motion was originally produced and is still being produced by a force outside of the planets; that a body has not a natural motion in it, aud when it moves, the motion must have been produced, and is beiug produced by a force outside of it."

If Newton's Principia be rejected, and his theory of centripetal force set aside, the true explanation of the phenomena Newton noticed will be looked for in a variety of speculations, among which that of Mr. Silverstein takes secondary place.

Mr. Stevenson recently brought out a new theory of centripetal force, or, rather, a theory of the persistence of energy, which substituted for the ordinarily accepted theory the hypothesis that a body moving in free space with independent motion has kinetic energy in the line of its motion and kinetic stability tending to prevent displacement transverse to its line of motion equal to its kinetic energy, and should a radical transverse force be applied equal to the kinetic stability, the body will then revolve in the orbit of a circle with a velocity equal to $\frac{v}{2}+v$, v being its original velocity, and according as the trausverse radical force is greater or less than the kinetic stability, so the curve will be one of less or greater stability, and the force of restitutiou will be less or greater.

As was once fiuely said by Prof. Tyudall, in an address before the British Association of Scientists, these questions will continue to be discussed by lofty minds "wheu you and I, like streaks of morning cloud, shall have melted into the infinite azure of eteruity."

Another philosopher, Mr. Julius Hensel, is to hand with a theme which he styles "bread from stones." He argues that a great and general mistake has beeu made in agricultural chemistry, and that since the first man uudertook to restore to worn-out soil the constituents that growiug crops extracted from it, the mistake has been perpetuated by applying the wrong kind of fertilizer. After an elaborate disquisition on the composition of animal and vegetable food, he argues that to make soil fertile it is only necessary to strew its surface with pulverized granite. He extols the beneficial results of the use of this "stone meal," and says: "It is now 400 years since the second half of the world was discovered, but the whole earth is only now discovered as far as the knowledge is concerned of how the inexhaustible treasures which are at our disposal in the nourishing forces of the rocks of the mountains may be utilized. Instead of workiug this colossal mine, men have bought the material of the fertility in the form of medicine; i. e., chemical fertilizers."

If Mr. Hensel's assertions are not antagouistic to the truth; if all that sterile soil needs is to have comminuted granite mixed with it to make it abundantly productive, he is a great human benefactor aud his discovery will revolutionize the world. The subject is of surpassing interest, for we must all eat, and when Mr. Heusel tells us that the use of 1200 pounds of "stouemeal" to each acre for each year for the space of five years will make sterile land fruitful, the possibilities are stupendous—that is, if Mr. H. is right. Trivial objections by those who make or sell fertilizers should not count. Where, as in this State, vast barren plains are bounded by equally vast mountains of granite, all so easily converted iuto food, the possibilities of increased food supply outrun ordinary imaginatiou, and the great problem of human sustenance is solved. It is a great point for the "Industrials" to kuow of such a possible combinatiou. Heretofore, azoic rocks have uot beeu looked upon as possessing any of the elements that enter into the composition of vegetable matter, aud it is probable that Mr. Hensel's theory may be combated by those who argue that the abseuce of carbon, nitrogen, lime, etc., in granite will seriously militate against its value as a fertilizer. Practical demonstration, successful experiment, will be necessary to convince the doubting that his theory is tenable. Like those who formulate systems of philosophy contradictory to the Newtonian theory of attraction, etc., the idea is more interesting than tangible, aud on each must, so far, be endorsed the verdict: "Not Proven."

THE mining returns for '94 show that the monometallists are having their way so far as silver production in the United States is coucerned—that the output of silver has been greatly reduced aud the output of gold very greatly augmeuted. Arizona produced three times as much gold as silver in '94. Colorado, looked upon since Nevada's decline as the silver State, has astonished the country with a gold output for the year of $11,000,000, aud in like manner with the other mining States and Territories. But the law of compensation runs through every line of life, aud though the total sales of silver certificates in New York in 1894 were only 95,000 ounces, against 2,626,000 ouuces iu '93, there not having been a single sale of silver in the board room from April 5, '94, to January 1, '95, yet the proper solutiou of this most important question cauuot much longer be delayed. Above and beyoud artificial restraints come public demands and requirements which are for the rightful recognition of silver, not as a matter of petty "protectiou" to the miner, but as one of necessary protection to the prosperity of the entire nation.

"DID the suspensiou assessment of '94 apply to incorporated compauies?" is asked by a Riverside subscriber. It certainly did. "Is machinery and plant on abandoned mine locatable?" asks an Arizonian. No. A failure to comply with Government requirements invalidates no ownership. Buildings, tools, machinery, etc., belong to the man who paid for them, and he can claim them auy time.

Personal.

COL. D. H. JACKSON is now superintendent of the Grand Victory mine, Placer Co.

ALFRED SWAIN has been elected secretary of the Union Con., vice C. C. Harvey, deceased.

W. D. CHAMBERS has been appointed superintendent of the Mitchell mine, Calaveras Co.

CARL KLEINSCHMIDT of Helena has received a diploma as professor from the Royal School of Mines at Freiburg, Saxony, the highest degree in mineralogy and metallurgy issued by that institution for the past fifteen years.

HON. JACOB H. NEFF, president of the State Miners' Association, is prominently mentioned among the candidates for the two years in the United States Senate to fill the vacancy occasioned by the death of Leland Stanford.

R. H. CAVILL left for Johannesburg, South Africa, last Sunday, where he will act as manager of the New Rand Mining Co. The careers of Hammond, Williams, Clarke, Clement and other California miners who went thither to superinteud important works illustrate the recognition by mine owners iu that far-off El Dorado of the value of practical men.

E. C. POTTER of Chicago, president of the Illinois Steel Co., left here last Wednesday on the China for Japan, at the request of the Japanese Government, to teach the Mikado's subjects how to utilize their mineral resources and to perfect plans for the construction of steel works, the cost of which has been estimated at from $2,500,000 to $10,000,000.

Concentrates.

THE 50-stamp mill on the Grand Victory mine, Placer Co., is about finished.

THE North Bloomfield Company is reported to have bought the Catskill mine, Bangor, Butte Co.

E. B. TRUE has purchased the Knott mine at Warreas, Idaho, from ex-Governor Willey for $12,000.

THE Mammoth mine, near the Mokelumne, Middle Bar, is reported sold to an English company for $30,000.

THE Englehardt Gold Extraction Company of Denver will build a twenty-ton plant near Prescott, Arizona.

IT is the reported intention of Alvinza Hayward to put a 100-stamp mill on the Oro Fino, near Shingle Springs.

THE miners of Montana are deemed to have won a victory in securing the selection last week of Leo Mantle as U. S. Senator.

THE Aspen, Col., big silver mine closes this week, and will wait for an advance in silver before resumption of work.

THE reduction works of the West End Gold Mining Company at Sherman, Colorado, will be completed and started up about February 1st.

W. S. STRATTON of Cripple Creek, Col., says he will give $2000 toward a miners' hospital at that place if Dave Moffat will give an equal amount.

THE Consolidated South Spring Hill Gold Mining Company has incorporated, John R. Tregloan superintendent, to work the Medinn mine at Amador City.

THE Gold Flat mine has closed down on account of the great amount of water. The pumps have been utterly unable to keep the water down, says the Nevada City *Herald*.

THE Baker City, Or., *Democrat* points to the $17,000 gold output of the Virtue mine for December as an indication of what the mines of that county can do when scientifically managed.

C. A. PLUMMER of Portland has bought the Jewett mine, five miles from Grant's Pass, Or. J. A. Gowan will be the superintendent, and will put in new machinery of modern pattern.

MESSRS. BROWN AND PEDRO NEGRO have sold their share in the Amarillas mine, Sonora, Mexico, to H. Hinds, one of the proprietors of the Colorado Co., for $50,000 and $30,000 gold, respectively.

THE State Mining Bureau has sent circulars to every miner and mine owner in the State asking for a complete report as to the total output of the mines for the twelve months ending Dec. 31st, '94.

THE recent offer of Captain Griggs to take sacked ores from Johnson creek to Everett at a cost of $8 per ton is another huge concession to ore shipping in upper Okanogan, says the Loomiston *Journal*.

THE McCauley Gold Mining and Milling Co. of Crevasse, Park Co., Montana, are about to put in a complete twenty-stamp mill. The Oro Fino Co. at De Borgia, Montana, are building a five-stamp mill.

MONTREAL MEN are reported to have made an offer of $200,000, half cash, for the Clinton mine, near Jackson, Amador Co. S. M. Shortridge, of this city, is the owner. There is a fine lot of machinery on the property.

DURING '94 it is estimated 30,579 flasks of quicksilver were produced in California. The '93 product was 30,551 flasks. The '94 shipments by land and sea for the first eleven months of the year aggregated 28,060 flasks.

AT Candelaria, Nevada, the tailings of the Holmes mine are being tested by Colonel Sutherland, with a view to working them by a leaching process. There are half a million tons of tailings at Caudelaria and Belleville.

THE Georgetown, Col., ore samplers paid out $513,159 for ore in 1894, which had a gross value of $764,058, showing that thirty-three per cent of the value of the ore produced in that district went to pay smelting and freight charges.

THE Florence, Col., Reduction Works made its first test last week, and the machinery proved all that was expected of it. The success of the plant is viewed with satisfaction at Cripple Creek. To that gold camp it means a greatly increased output.

FROM the Altar district, in Sonora, it is reported that the Mexican authorities last week confiscated $20,000 in gold which was being taken out of the country without paying the export duty of ten per cent. There are about 2000 men on the grounds, mostly Mexicans and Indians.

THE new leaching plant for the Bi-Metallic at Phillipsburg, Montana, handles 700 tons of roasted tailings or 300 tons of dried tailings every twenty-four hours. There are 160,000 tons of these tailings from which the Russell process extracts 75,000 ounces of silver and $3000 in gold per month.

THE Kennedy district, Humboldt county, from the mines of which so much was expected last fall, is reported dull at present. There appears to have been mismanagement or a "freeze-out" at the mill erected some time ago. Some say that all will be well again as soon as certain mines have been bought.

THE Coolgardie gold fields are booming. One hundred and twenty companies have been floated from London, England, in the last three months, and 2000 leases have been taken up in Australia. The suffering from want of water at the mines is said to be horrible, and a great many deaths from thirst are reported.

THE returns for the Harqua Hala, Arizona, mines for the month of November '94 are: Crushed during the month, 3235 tons; estimated gross value of gold produced, $27,200; miscellaneous revenue, $500; total revenue, $27,700. The estimated total expense was $12,600, leaving an estimated profit for the month of $15,100.

AT Telluride, Colorado, on the 12th, Judge Gabbert made a decision, the first of the kind in Colorado, that operators of stamp mills must use reasonable means to prevent the flow of tailings into streams where others would be materially injured thereby. Both plaintiff and defendant excepted to the decision and the case will be appealed.

THE weekly yield of the Con. Cal. & Va. mine is about 350 tons, averaging $50 a ton. A body of ore is in sight extending from the 1650 down to the 1750 level, there being a continuous opening through the deposit between these two points. In drifting north and south on the ore body and in sinking upon it below the 1750, it is expected an immense amount of ore will be obtained.

THE Ajax (Utah) Mining Co. have under advisement bids for the erection of a 100-ton concentrator. They have sold 100,000 shares of the capital stock to Samuel McIntyre at a figure which would make the valuation of the entire property in the neighborhood of $470,000. Mr. McIntyre has been elected vice-president and general manager of the company, vice Henry Shields, resigned.

THE gold nugget in the turkey's gizzard has been provokingly slow in coming to light this season. It was due in Josephine Co., Or., a week before Thanksgiving, and should also have been heard from in western Colorado Christmas eve. It is only last week the regular item turned up, and in Helena, Montana, which furnished in two turkeys, bought by M. E. Nichols, nearly an ounce of gold and thirteen sapphires.

THE currency question has been solved at De Lamar, Nevada. The De Lamar Company has issued coins. The denominations of the coins are 12½ cents, 25 cents, 50 cents and $1. On one side is printed "Good for (whatever denomination) in exchange," and on the reverse, "At the Office of De Lamar's Nevada Gold Mining Company." Silver being very scarce, these coins are very handy in making change. The De Lamar Company redeems all of these coins. They are made of aluminum.

THE report of the Transvaal Gold Exploration and Land Co. shows the return of bullion to have averaged over 2000 ozs. per month, or a total of 24,676 ozs. for the year, as against 11,315 ozs. for 1893. The cyanide process has dealt with 8491 tons, yielding 9282 ozs. of bullion. The new twenty-stamp mill and the electrical plant are completed, and the cyanide plant is being added to. The aerial rope and tramways connecting the Theta and Chi workings with the new mill are now nearly completed, and will greatly reduce the cost of transport.

AT the Broken Hill Proprietary, for the week ending Dec. 20th, 10,156 tons of ore were treated, yielding 860 tons of lead, containing 225,431 ozs. silver; also 1150 tons, treated by amalgamating and leaching plants, producing 12,113 ozs. silver. A dividend of 1s. per share is declared, payable Jan. 10th. For the week ending Dec. 27th 10,661 tons of ore were treated, yielding 900 tons of lead, containing 224,823 ozs. silver; also 712 tons treated by amalgamating and leaching plants, producing 12,109 ozs. silver.

THE *Keystone* says that the mining community of Idaho is eager for a proper legislation for the promotion of the chief industry of that State. The present mining laws allow prospectors to locate ground without compelling them to do any work upon it for a long period of time. As the laws stand now, a prospector can locate thousands of acres of mineral ground, have it recorded, and can hold this ground against all comers until the first day of January, 1897; and he can do this without any work on the ground.

ACCORDING to the Idaho *World* the Treadwell mine, in Alaska, will probably have to take second place when the Boulder, eight miles north of Idaho City, begins to produce to its full capacity. A crosscut has been run over 120 feet in solid ore, and is not yet across the ledge. The assayer for the company has been making assays all the way across, and finds that the ore runs from $8 to $10 per ton. The company (the Gund Gold Mining Co.) contemplates putting in seventy more stamps next summer. Their new thirty-stamp mill has begun crushing.

NEAR Kaslo, B. C., last Tuesday, three miners named Moore, McMillan and Mitchell, owners of the Eureka mine, were on their way to the mine and while climbing a mountain a mass of snow 20 feet deep and 200 yards in length became detached. The three men ran, but were all overtaken by the slide and carried along with trees and howlders to the canyon below, where the life was crushed out of them. Their bodies were recovered. Two miners who were working on the Silverton mine in the path of the slide are missing, and they were probably killed also.

THE Blue Lake Mining Company, that proposes to work 400 acres of placer ground twenty-five miles from Shoshone, Idaho, will use an entirely new milling process in the mine, known as the Bard amalgamating machine. It employs a riffled copper plate, and uses quicksilver. The company has five of the machines in use, and has been able with them to save 95 per cent of the gold, while handling from 700 to 1000 yards of dirt per day. The hydraulic equipment of the mine includes two miles of flume and ditch, with 1000 feet of eight-inch pipe line. The pressure is 100 feet. Water is drawn from springs which have a flow of 3000 inches.

AN explosion of giant powder appalling in its results took place at Butte, Montana, on the night of the 15th inst. A fire in the Butte Hardware Co.'s warehouse had gathered nearly the entire fire department of the city, and according to press dispatches several tons of giant powder in the Kenyon-Cornell Commercial Company's warehouse, illegally stored there, exploded, wreaking ruin and death. There were three several explosions. About 60 people were torn to pieces. Many more will die of the injuries received. The unfortunates were mostly so mangled that identification was impossible. A searching investigation is demanded and should be had.

THERE is a man in Salt Lake who claims that he has discovered a vegetable compound that "ripens" gold ore. According to his theory ore is ripened through the juices of the vegetation which grows above it. The rock may contain many thousands of dollars' worth of gold, but until it is ripened by coming in contact with these vegetable juices it is not discoverable by assays or otherwise. According to this genius, by treating gold rock with this solution the hearing capacity is increased at a ratio of about 18,000 to one. Ore that goes only a trace, after being subjected to this treatment will mill $17,000 or $18,000 per ton. If this theory prove tangible, gold will be demonetized, sure.

THE Gold and Silver Extraction Co. of America (Limited) have brought suit against the Mercur (Utah) Gold Milling and Mining Co., praying for an injunction to prevent defendants from using the MacArthur (cyanide) process of extracting gold and silver from ores and for damages. The plaintiffs allege that the defendant corporation induced them to enter into a parole agreement, whereby the plaintiffs instructed the defendants in the use of the process and assisted them in directing a plant for the operation of the same, and the latter agreed to pay a royalty of $1 for each ten tons of ore treated. From September 1, 1891, until August, 1893, the complaint goes on to state, the defendants acted under this agreement and paid more than $13,000 to plaintiffs as royalties, but after that period they ceased payment, and are now infringing on plaintiffs' letters of patent by using the same without payment therefor.

CLAUDE M. BENNETT tells the Idaho Springs *Gazette* that he went to the mint in the city of Mexico and asked to have a United States dollar weighed and compared with a Mexican standard dollar. The Mexican dollar went down in the balance, and the United States went up, showing the Mexican coin to contain more silver. A little later Bennett went into a restaurant. The dinner cost $1. He paid with a United States silver dollar. The restaurant cashier took his United States coin and handed him back a Mexican dollar, heavier than that from the United States; it was worth only half as much. In Texas, at the railway eating house, a meal costs fifty cents. Cross the border into Mexico and you are charged $1 for the same kind of meal, though if you tender a United States dollar in payment you will get back a Mexican dollar. The price is just the same practically. It does look, says the *Record*, as if the able financiers of the civilized nations had muddled things somehow when of two coins made of the same metal the heavier one is worth only half as much as the lighter one.

THE Australian *Mining Standard* always has a yarn about some alleged "American prospector." This time it is about one Adams who was "prospecting somewhere in the mountains in New Mexico." While wearily trudging along one hot day through the gulch, where the sun had a good chance at his back, he suddenly smelled smoke. The phenomenon struck him as odd, and he glanced quickly in every direction to ascertain the origin of the smoke; but, seeing nothing, he resumed his journey. A moment later the smell returned stronger than ever, and the breeze just then blowing in the direction in which he was walking, a light wreath of vapor curled about his ears, and gave him to understand that his haversack was on fire. Like all miners, he carried a large lens for the purpose of examining the specimens and the sand in his pan, and the truth flashed upon him. For want of room he had hung the glass on the outside, and the rays of the sun had been concentrated on his haversack, which was thus set on fire. As among its contents were twelve or fifteen pounds of powder, he lost no time in dropping the dangerous burden and getting away as far as possible before it exploded. The haversack fell between two huge stones and cuddled down out of sight. Adams soon reached a safe distance, and disconsolately watched the smoke arising from his sole worldly possessions. Suddenly there was a deafening report. The ground trembled, and Adams dodged behind a huge stone to escape the fragments of flying rock. Rising, he went to the spot to gather what he could find, when his eyes almost started out of his head at seeing the quartz that had been blown up fairly glittering with gold. His powder had done better on its own account than it had ever done on his, and had literally blown open a gold mine for his benefit. He was made a rich man in an instant, and named his mine the "Nick o' Time."

J. J. VALENTINE, of Wells, Fargo & Co., has issued his annual report of the precious metals produced in the States and Territories west of the Missouri river, including British Columbia, during the year 1894. His figures show the following aggregate: Gold, $45,892,668; silver, $28,721,014; copper, $22,270,294; lead, $8,223,513; total, $105,113,489. The value on which these totals were estimated was: Silver, 63 cents per ounce; copper, 10 cents per pound, and lead $3.11 per hundredweight. The production of the various States and Territories is tabulated and shows California, $14,188,582; Nevada, $3,100,560; Oregon, $1,711,662; Washington, $443,563; Alaska, $906,246; Idaho, $7,976,220; Montana, $30,250,000; Utah, $7,202,588; Colorado, $26,768,050; New Mexico, $1,871,359; Arizona, $6,995,831; Dakota, $3,045,909; Texas, $338,542; Wyoming, $45,000; British Columbia, $269,377. In addition to the foregoing there is also a tabulated statement of the annual products of lead, copper, silver and gold in the States and Territories named from 1870 to 1894 inclusive. There is also a statement of the product of gold and silver in the republic of Mexico from 1877 to 1894, values upon mintage basis, which shows the gold output of Mexico during those years to have been $17,939,000; silver, $600,145,000; total, $618,084,000. The exhibit of coinage of gold, silver and copper in the republic of Mexico from July 1, 1873, to June 30, 1894, was: Gold, dollars, $10,450,057; silver, dollars, $507,317,921; copper, dollars, $203,296; total, $517,971,274. The exhibit of the coinage of Mexico, from the establishment of the mint in 1537 to the end of the fiscal year 1894, shows the following totals: Colonial epoch, 1537 to 1821, $2,151,581,960; Independence, 1822 to 1873, $809,655,251; Republic, 1873 to 1894, $517,971,274; total, $3,479,208,485. The exports of silver during the past year to China, Japan and the Straits, etc., are shown as follows: From London, $47,502,180; from San Francisco, $12,520,678; total, $60,022,858, as against $67,715,485 of last year: pounds sterling estimated at $4.84. Mr. Valentine's figures give the gold output of California for 1894 at $12,540,646, as against $12,175,207 produced in Colorado. It is believed, however, that data now being collected will show that the gold output of this State for 1894 will more nearly approximate $15,000,000 in the aggregate.

Obituary.

C. C. HARVEY, for many years secretary of the Union Con. Mining Co., and connected with other mining companies, died suddenly on the 11th inst. at his residence in this city in the 69th year of his age.

ASSISTANT NAVAL CONSTRUCTOR GEORGE W. STREET, United States Navy, died in this city on the 12th, of pneumonia. He had arrived from the East but a few days before, for duty at the Union Iron Works. He was appointed from Wisconsin on July 1, 1889, and had until recently been attached to the navy yard at New York.

Live Oak Mine, Nevada County.

TO THE EDITOR:—A. McMahon, Jr., superintendent of the Live Oak mine, which is situated on the San Juan ridge, sixteen miles from this city, recently paid a visit to Nevada City. In a conversation with the writer he stated that the future of the quartz mining in that section of our county is very promising indeed. Most of the mines operating there have shown marked improvements in the past few weeks. Regarding the Live Oak mine he produced some very valuable and important data. From present indications it is one of the most promising and important of our new mines. When properly developed it will become a large and valuable bullion producer. The facilities for operating the mine cheaply are many and will undoubtedly cut a prominent figure in its future development. The mine is owned by a company of San Jose capitalists. Wm. McMahon of that city, father of the present superintendent, is the largest stockholder of the company and has given proof of his confidence in the property by investing a large sum of money therein.

The Live Oak is located on the same side of the river and in close proximity to the famous Delhi mine, from which such fabulous sums of gold have been extracted. The the locality is a favorable one no one acquainted with our county will deny. In fact, as I remarked last week in these columns, we anticipate great progress in this particular section of our county during the year upon which we have just entered, relative to quartz mining.

The mine is worked by tunnels, which make the mode of operating much less expensive. There are three tunnels penetrating the hill which can be used for practical purposes. The lower tunnel, through which operations are now being conducted, has been driven a distance of 600 feet into the hill. From the end of this tunnel to the apex of the ledge there is a vertical distance of 700 feet. This implies that they already have 700 feet of backs, or stopes, opened and ready for working. From the apex of the vein to the base of the hill there is a vertical distance of 1200 feet; and the fact that this immense body of ore can be extracted by tunnels would indicate a permanent and valuable property. The vein in places is fourteen feet wide, but the average width is about three feet. Some of the ore from this ledge has assayed as high as $400. Ninety tons of ore were crushed at the Delhi mill with a result of $7.20 a ton, not including sulphurets. The sulphurets are worth $102 a ton. The average mill test places the value of the ore at $7.50 a ton. The claim is 3000 feet long by 600 feet wide.

The owners of this mine have reason to feel proud of their possession. The facilities for operating it cheaply, as already stated, are many, and with the erection of a fine modern quartz mill, which can be constructed without heavy expense, the mine can be made very remunerative in a short time. Much credit is due to Mr. McMahon for the great interest he has taken in quartz mining in this district, and for the miner-like manner in which he has developed this mine. He has shown exceptional skill and mining ability in operating this property, and we believe that with the above mentioned improvements he will eventually have a great mine. SAMUEL BUTLER.

Mining Items from Shasta County.

REDDING, CAL., Jan. 10, 1895.

TO THE EDITOR:—The heavy rain in this section has furnished an abundance of water for gulch mining, and many a hungry miner is now a monometallist. The Niagara, now worked on the tribute system, has been making a fine record the past two months. The Myers property, under Prof. Morton's management, is working twenty men at present. The sale of the Iron Mountain property to an English syndicate has lapsed, the date for payment being January 1st. Some large commissions were connected with it that will not materialize. The Uncle Sam, on Squaw creek, drops thirty stamps steadily, and also runs a Huntington mill on soft ore. The Old Diggings keeps up a steady grind. The rich ore chute that yielded so handsomely a few weeks ago is commencing to get a little lean. Ore running $500 per ton was too good to last. The Quartz Hill is running ten stamps and also shipping ore to Selby's. The quartz milled is low grade but yields a profit.

The Sacramento river dredge, operated this summer by Destlehorst Bros., has proved the best paying investment in the county this season. On some days as high as $1500 was made at an expense of $12. The river bed is fabulously rich. The dredge does not save ten per cent of the gold.

A new era in drift mining for this end of the State has been inaugurated by the Parsons Company, operating in Oregon gulch. A year ago old man Parsons commenced sinking on the contact between sandstone and slate. He soon died, but his heirs kept on working, with the result that the gravel and gold in the seam got larger and richer. An incline 300 feet has been run, representing a vertical depth of 200 feet. They now have four feet of gravel that averages 70 cents per pan, and the bedrock still dipping.

Hydraulic work is about to be resumed on the claims about Horsetown, on Clear creek, which have laid idle for fifteen years. F.

Photographing Frost Flowers.

Written for the MINING AND SCIENTIFIC PRESS.

At this time of the year when Jack Frost draws his beautiful ferns and flowers on the window pane, who has not often wished that this beautiful work could be made permanent?

It will be interesting to the professional as well as the amateur photographer to know that it can be made permanent, and far more distinct than Jack Frost ever painted them, yet with all the beauty of every line and curve that is found in the original. But one must enter into copartnership with the frost king himself to attain the desired end. It is accomplished by the old wet-plate process. Here is the secret:

The glass plate is flowed with collodion and immersed in the sensitizing nitrate of silver bath in the usual manner. When removed from the bath it is put in the light-tight plate holder and placed where it will freeze. While frozen it is placed in the camera, focused on a white screen, and developed in the usual wet-plate way. The plate should be kept frozen till the developer is poured on. Beautiful border negatives can be made in this manner, and no two pictures quite alike. To produce different effects, the holder, when laid out to freeze, should be placed sometimes on end, sometimes on the side, and at other times on the face, flat down. The plate does not require very thorough draining when removed from the bath. Time of exposure in the camera will be governed to suit the artist's taste. Of course, a long exposure gives flat pictures. We have made negatives in one or two seconds that gave prints as distinct as a pen-and-ink sketch on white paper. We tried it without the use of the camera, by a slot admitting a streak of white light into the dark-room. The frozen sensitized plate was passed across the beam of light and developed as usual, but the result was not so good as in the camera.

HENRY W. BROWN.

Custer, Wash., Jan. 10, 1895.

The Crooke Process.

One of the processes recently brought to the attention of the public that promises to revolutionize the treatment of ore in mountain towns is the one called after its inventor, Prof. John J. Crooke. It is a modification and improvement on the old Augusta process, which was introduced in Germany half a century ago. It has been in use in Prof. Crooke's mill at Silverton, Col., for the past two years.

The ore is broken in a rock crusher and from there is fed to ten rapid drop, dry crushing stamps, where it is pulverized. The pulp is then mixed with a certain percentage of salt and roasted in an old-fashioned reverberatory furnace, thus converting the silver into a chloride. After lying on the cooling floor for twenty-four hours it is charged while still very hot into large leaching vats fitted with proper filters in the bottom. A very hot saturated solution of salt brine which has been strongly acidulated with sulphuric or hydrochloric acid, to which has been added a certain amount of a solution Prof. Crooke has not yet patented and the nature of which he keeps secret, is run upon the pulp and allowed to stand for about an hour, when it is drawn off on precipitating filters of peculiar construction. These filters consist of a series of square wooden frames about seven in number and each four or five feet square, arranged one above the other. To each of these frames a coarse burlap is tacked and in this is placed cement copper.

The brine solution, after passing through the ore, is conducted to the uppermost of these burlap filters, from which it percolates through the series and drops into the tank below. Immediately the brine solution containing the silver touches the cement copper the silver is precipitated, forming magnificent crystals that are often as much as two inches in length. An amount of copper goes into the solution in place of the silver and this is precipitated on scrap iron in the tank below the filters and thus recovered.

When the precipitation of the silver from the brine is completed it is carefully scraped off the remaining cement copper and melted into bricks, ready for the refinery or for shipment as the case may be. The cement copper, still containing a little silver, is used on other filters. The solutions are purified by crystallizing out the sulphate of soda and by precipitating the salts of the baser metals. This Prof. Crooke does but once in each season, treating from 1000 to 2000 tons of ore in the meantime.

Prof. Crooke claims that ores carrying even a considerable percentage of the baser metals can be treated by this process without difficulty. A mill is now being erected by Prof. Crooke at Pueblo.

African Diamond Mines.

Alfred Hale says the entire diamond-bearing district of South Africa has been walled in by a high stone wall, and nobody is allowed to pass in or out unless he is subjected to the closest scrutiny. Inside the walls are 10,000 negroes, who are secured for periods of six months at a time to work in the mines. The negros are fed corn meal, and are paid fifty or sixty cents a day. They come from the interior of the country, 500 or perhaps 1000 miles away, and are ordered to the mines by the chief of the tribes on the pain of instant death if they refuse. The agent of the diamond syndicate pays the chief a liberal amount for his aid in sending workers to the mines, and the poor, ignorant negroes have no alternative but obey. Once inside the gloomy walls the black man has no possible chance of escape, and he delves like a galley slave until his six months have expired. Then he is paid off, and the entire delegation from one tribe marches home across the desert in a body. It is seldom that a black is seen a second time in the mines.

There is a very satisfactory reason, so far as the individual is concerned, why he never returns. The diamond miner carries home with him money enough to buy several wives. If he is careful of his earnings he has enough hard cash to buy four wives, and that is the summit of his ambition. Any negro owning four wives is exempt from labor for the remainder of his days. He is known as a "gentleman," his wives do all the work for him, and he poses as one of the big men of the tribe.

This is, of course, a strong inducement for a black man to go to the mines, but the chances are that he will die from exposure or fall into bad company and lose his money, so the nabobs are not as numerous as one might suppose. Very little is known of what is going on in the interior of the diamond region. Every avenue is guarded by detectives, and a stranger caught loitering about in the neighborhood is liable to be sent to Cape Town for five to fifteen years, on the charge of buying stolen diamonds.

Mr. Hale said that the trade in stolen diamonds became so heavy a few years ago that the owners of the mines organized to drive the traders out of the country. The devices for concealing and carrying the diamonds out of the mines were remarkable for their ingenuity and their success. The law of the Dutch Republic required that any man charged with diamond theft, or purchasing stolen gems, should have the privilege of a trial by jury. As the majority of the jurors were generally engaged in the same shady transactions the convictions were very few and far between, and the country swarmed with country buyers. Fortunes made on the outside were larger than those on the inside. The mine owners bought up the legislators, and a law was passed requiring all diamond cases to be heard before three judges, who were given the power to send the guilty man to the breakwater at Cape Town for a long period of years.

The law has worked like a charm. The judges are said to be absolutely unapproachable from the standpoint of the diamond buyer, and a long procession of disappointed speculators has been marched off to the south, so that there are now not less than 1000 convicts from the diamond region piling up stones to keep back the ocean at Cape Town. Mr. Hale says it is the most disheartened body of men he ever saw, many of them being possessors of large fortunes. The edict has gone out against the diamond buyer, and he was practically not in the field this year at South Africa.

Of course, the European syndicate is correspondingly happy, but the Diamond Trust regulates the output at its will. Merchants and dealers at Kimberly are on the verge of bankruptcy, as they are under the eyes of paid detectives every hour, and their books are regularly inspected by officials of the Government, who are working in the interest of the European mine owners. The glory of Kimberly has departed, and the money which once went into the capacious pockets of the merchants now goes to enrich the gilded palaces of the European capitalists.

Aerolites.

These strange objects, which penetrate the earth's atmosphere from outer space, are stones containing a small percentage of iron alloyed with nickel. Twenty-six of the elements known to exist in the earth have been found in meteorites. In size they range from a grain of sand upward, but are seldom seen weighing over a few pounds. It is believed that millions of these small bodies, occasionally in swarms but often widely separated from each other, are flying through inter-stellar space. There are several resemblances, in their orbits and other respects, between the meteors and comets, and it is possible that a still closer relationship may yet be discovered. Proctor and others were inclined to think that the meteors had been ejected from once active volcanoes on the moon, and some astronomers have suggested that they were thrown off explosively by the planet Jupiter, our sun or other suns (the fixed stars). Such ideas, however, must be regarded as more or less plausible conjectures, and not as accepted facts.

A Thermostat Alarm System.

The object of the system illustrated herewith is for use on lines of shafting to detect the heating of the bearings, and thus call attention to it before it becomes hot enough to do any damage.

The apparatus consists of small instruments which are spaced on the ceiling of a room or any other place it is desired to guard against fire or excessive heat. These instruments are then connected by a system of wires to some central point, as the office, where an alarm bell and indicator are located. The bell instantly gives an alarm whenever the temperature in the vicinity of one of the instruments rises abnormally, while the indicator, which is, in principle, like the well-known annunciator, shows at a glance the exact location of the instrument which is overheated.

In an isolated factory it is customary to place extra alarm bells in one or two houses for night alarms, as, for instance, the house of the superintendent, then when an alarm is given they have only to go where the indicator, generally located on the outside wall, will show the exact location of the trouble. In cities it is customary to connect the

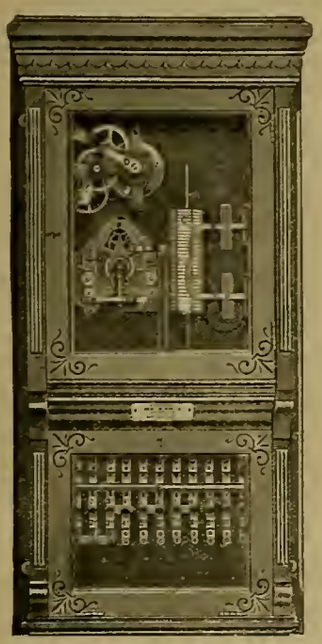

Fig. 1.

alarm with the nearest fire department house, and often with two separate houses. A circuit breaker *D* is then added, which causes the instrument in any building to strike a certain number on the alarm bell in the engine house; this shows the firemen exactly which building the fire is in. Such a device is, of course, necessary where there are a number of buildings wired to the same engine house. The exact location of the fire is then, as in the isolated plant, shown to the firemen on reaching the building by the indicator.

It is necessary in any such system to be absolutely sure that the batteries and the circuits are always in perfect order, and to accomplish this a very thorough system of testing has been devised.

Fig. 1 shows the testing case which is generally located in the office, and which is kept locked so that it cannot be tampered with. The clockwork *C* moves, at a uniform rate, the cylinder *C'*, which carries a roll of paper. The magnet *B* is connected with the outside lines, that is, any lines running outside of the building, as to the superintendent's house and the fire department house. The maguet *A* is attached to the inside wiring of the building. Now, by turning the lever *E* shown in bottom of case, all the circuits are tested. Those inside of building are put in series causing the current to flow through magnet *A*, pulling the armature and punching the paper in *C'*.

The outside circuits being in series, the current is diverted through magnet *B*, causing the armature to punch hole in roll, *C'*. The paper on *C'* is so ruled that the exact time in the week of the year, the day of the week and the hour of the day that the test was made can be seen by examining it.

The object of this mechanism is to give an accurate record of these tests, thus making it possible to see that the man having charge of the apparatus tests it as frequently as is required. It also serves as a record for the insurance companies, similar to the ordinary watch-clock record. The whole apparatus is so arranged that it is very difficult for an unscrupulous attendant to tamper with it and make up a back record if he forgets to make it at the proper time.

If in any case, on throwing the lever *E*, it is found that no record is made on the cylinder *C'*, it shows that there is a fault somewhere in the lines; then, by removing the top of the case, access can be had to the various circuits, so that the fault can be very quickly run down.

The system of wiring used in the buildings is a double system, the wires starting from the office where the testing apparatus, etc., is located, run through the complete circuit and return to the office again. With this arrangement, the cutting of a wire at any point does not disable the instruments which give the alarm, as there is always a connection back the other way. Fig. 2 shows the instrument which is placed wherever it is desirable to have an alarm given when the temperature gets above the proper point.

It is customary to set the thermostats so they will operate at about 140° (the usual fusing point of an automatic sprinkler is 160°), but this can be made much higher if it is desired to place them in hot places, such as dry rooms or on ceilings over boilers. Again, if it is desired to have them very sensitive, it is perfectly possible to lower their point of operation to 100° or even less.

The cut shown in Fig. 2 is enclosed, as shown in Fig. 3. For dry places this case is ordinarily made of wood, while for damp localities it is made of porcelain, having a porcelain cap which screws on to the base and entirely covers up all the connections, leaving only the bottom of the mercury cup projecting in a position where it is readily subject to heat.

Fig. 3.

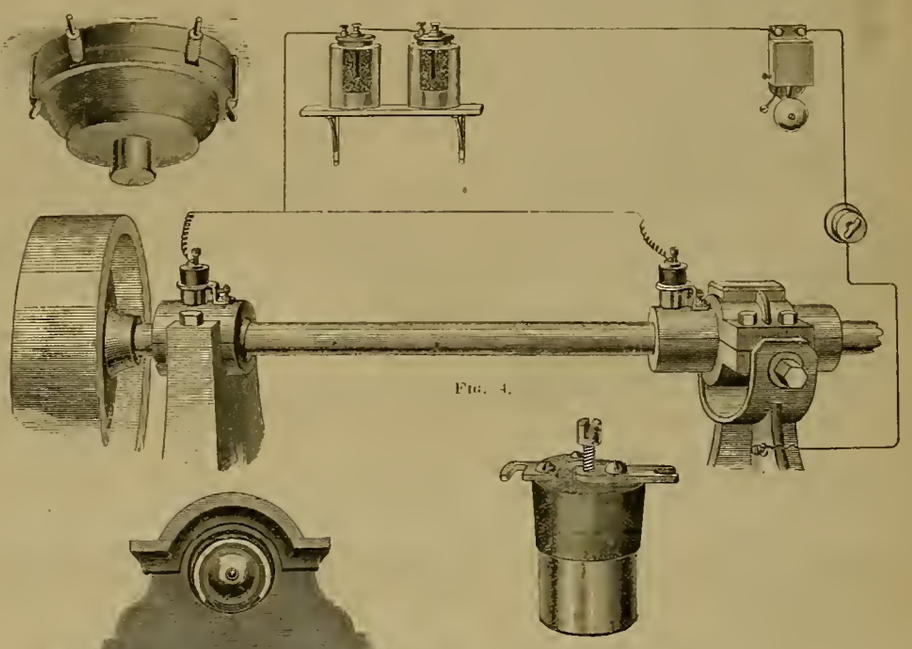

Fig. 4.

Fig. 2.

Fig. 5.

Another use to which this thermostat has been put is shown by Fig. 4. Here the little mercury cups are fastened directly to the top of the bearings of a line of shafting, the circuit being completed through an electric battery and an alarm bell, and whenever a bearing heats beyond a safe point, which point can be exactly determined by proper adjustment of the movable screw of the thermostat, an alarm is at once given by the bell.

Fig. 5 shows the indicator which is used with the journal bearing system, so that it may be ascertained at once from what bearing the alarm comes. This is accomplished by first numbering all shafts, or, perhaps, groups of shafts, and then wiring each one or each group back to the indicator board. Then the springs on the board from which these wires start are numbered to correspond, as shown in Fig. 5. When an alarm is given the lever handle is turned through the circle. The bell will stop ringing the instant the handle is moved from its normal position, but will ring again the instant the lever passes under the spring contact to which the circuit containing the thermostat giving the alarm is attached, thus indicating at once the point of trouble.

A Soft Thing.

The spies of the Anti-Debris Association are in this section. They ride out a few miles every day to exercise their horses, and to make a pretense of doing something for their employers. When they return to Yuba City they will probably take along two or three bottles of muddy water, as evidence that hydraulicking is being carried on in this vicinity.

There has been considerable hydraulicking done the past few days, and an immense quantity of debris has been washed into the creeks and rivers that are tributary to the navigable streams. This has been done in the face of the rule of the courts that no more debris shall be washed into these streams, but it has been done by a power that is higher than the courts, and which heeds not the edicts of man.

It is one of the immutable laws of nature that the water will run down hill, and people who live at the bottom of the hill are apt at times to get more water than they want, and with it a lot of extraneous matter that is carried along by the water. Hydraulic mining is not the sole cause of the trouble of the valleys, but nothing can make some of the people in that section believe but what it is responsible for it all.—Nevada City Transcript.

The Chicago *Tribune* says that in India the price of all commodities has advanced as silver has depreciated, and that the advance in wheat has been fifty per cent. The average price of what in the United States in 1873 was $1.20 per bushel, and as England imported during that year from India nearly 1,000,000 and from the United States about 6,000,000 bushels, we may reasonably assume that the price in India was about the same as in the United States, or say $1.20. If wheat has advanced fifty per cent in India since 1873, it must be worth $1.80 to-day. Last year England imported from India about 60,000,000 bushels. The average price of wheat with us was sixty-three cents, and according to the *Tribune* the average price in India was $1.80. Now, will our contemporary explain how it chanced that English merchants purchased so largely in India at $1.80 per bushel when they could get as good an article nearer home for sixty-three cents?

Dr. Heine Marks, a St. Louis hospital physician, claims to have discovered a cure for diphtheria which is superior to antitoxin. It is composed of two chemicals. One is applied by swabbing the throat and the other by a hypodermic injection. He asserts that this system is free from certain objections inhering in Professor Behring's plan; it never promotes abscess or decomposition by reason of a diseased condition of the horse's blood from which the serum is obtained, nor does it breed other microbes, as the antitoxin will if not properly or carefully handled.

Mining Reports and Mine Salting.

(*Continued from page 33.*)

ship had been surveyed in anticipation of the future rush for land. Some natural cracks in the country rock true fissure veins which Nature had overlooked when the mineral solutions were ladled out, had been filled up with a mixture of broken tin ore from Cornwall, copper tailings from Lake Superior, and soluble silicates for cemeuting material. Iu the camp of the promoters we found a barrel of the soluble silicates used.

In the meautime, the idea of the value of the discovery had grown so much that it seemed necessary to sell the property in London. The Uuited States could not hold it, and a financier—who was really a believer, was seut across the water. Curiously enough, he applied to people for whom I had previously made reports; aud on my return to headquarters, with the principal vein in my possession, I found a cahle askiug me to report how many millions it was worth, which I was able quickly and accurately to determine. Some years later in Colorado I was introduced to the gentlemau who planted the deposit with the explanation that I was the individual who had taken away his best lode in a small boat. The circumstantial report by the Cornish mining captain I have since heard explained by the fact that he was not accustomed to the particular braud of champagne used on the expedition.

My first report on a silver property in the same country was not calculated to breed confidence in min..g methods. I had left England with a full report by a government surveyor of the mine and its riches, but the claim was covered by the virgin forest—not a sign of outcrop or working—nothing to sample. There was nothing to report on but a magnificent crop of black flies and mosquitoes. The sanguine government surveyor had evolved his description out of his inner cousciousness, and aided by a ten-foot shaft on a small vein on an adjoining property. Since that time I have never felt a blind confidence in government surveyors as mining experts.

The salting of samples is, however, much more common than any other form of getting ahead of the expert. It is less expensive than salting iu advance, more deadly, and cau be nicely adjusted to circumstances and to the iudividual weakness of the victim. Wheu the owner of the mine, or any one connected with him, is allowed to assist in the sampling itself, there is no lack of opportunity with some ores for the artistic salting while in the mine; but, as a rule, engineers do not have the requisite faith in human nature to accept such assistance unless the character of the ore and kind of samples required make salting impossible at the time. In a strange district where assistance of some sort has to be obtained in breaking and transporting large samples, and the character of such assistance is not absolutely certain, the engineer must guard himself by duplieating entirely alone certain test samples. Assuming that samples have been secured without any chance of outside interference, the business is by no means ended, for the enterprising salter will follow those samples until actually pauned or assayed or taken out of his reach. I propose to illustrate some of these special dangers by the aid of a few personal experiences which will show that neither keeping samples locked up or sealed, or delivered to post-office or express company, will insure absolute protection iu all circumstances. In fact, to paraphrase a patriotic maxim, it may be said that "eternal vigilance is the price of freedom from salting."

To the successful cultivation of the art of salting, no great knowledge or experience of mining is necessary, any more than a study of architecture is essential to the practice of burglary. Trne ability will assert itself in this as in other employments by the inveution of new means to meet special cases, and by a proper discretion in regulating the dose of salt administered to the temperament of the patient. Sometimes the honest miner will freely relate stories of methods by which experts had been salted, implying delicately that no such schemes would be successful with his hearer, but reserving one, undescribed, for purposes of personal illustration later. As an example of the unexpected, which may oceur after samples have been safely removed from the mine, I may refer to a case in the Rocky mountains, where I had taken some samples to the nearest town and made arrangements with the loeal assayer for the use of his office. I preferred to make my owu assays, not from any chance of his kuowing where the samples were from, but rather from a distrust of his somewhat rule-of-thumb methods. I allowed his brother professional to continue his work while I did mine; aud, although apparently quite satisfied that I should pay him for the assays and do the work myself, his feelings must have been injured, for he doctored my samples without any other possible motive.

This inhospitable action caused me some annoyance and extra travel, but otherwise fortunately had no serious results beyoud somewhat lessening in me the proper Christian belief in one's fellows.

It is remarkable how generally the elementary knowledge of salting is distributed over the earth. Wherever mining is, there the salter is likely to be developed, regardless of differences in climate, language or religion. The art is not unknown in England. Not long ago I was asked to look at a gold placer in Wales, and though I should not have picked the country myself for exploring purposes, the terms offered left all the risk on the other side—so I went. The owner took me over the ground, aud I industriously panned in all the likely spots pointed out with never a color to eheer my heart. The owuer delicately intimated that perhaps I was not much of a hand at panning, and, further, that my gold pan was a poor contrivance. He thereupon sent up into the mountains for a certain Welsh mining captain, who duly came down with a Mexican wooden batea, and promptly produced good prospects from various places. He was so very skillful that when I gave him a sample of my own tailings from tests before he arrived, without mentiouing their source, he got a fine healthy show of gold even from them. When I mentioned that he had been working on wbat I washed out without getting a color, the Welshman was so confident of the fault being on my side, that I took half of the next sample he was about to wash and showed in my pan a better prospect thau he did with his half.

(*To be Continued.*)

No Occasion for Spies.

The second annual report of the United States Debris Commission, which has recently been submitted to Congress, contains many items of interest to the people of this part of the State, comments the Marysville *Democrat*. The Commission require each mining company that operates a hydraulic mine to report to them monthly, iu whieh tbe amount of earth washed and inches of water used is stated in in detail. W. B. Storey, a competent and trustworthy assistant, has visited and inspeeted the mines of tbe district during the entire season, watching not only the mines operated under permit but those that have not yet constructed restraining dams or settling reservoirs.

The Commissiouers have visited the miues in person where applications have been made for permits, and they have used due diligence to enforce the provisious of the law. The inspections and reports, say the Commissioners, relate to the effectiveness of restraint of detritus, and include observations of the quantities of materials escaping to the water cources. A system of observation has also been developed by the use of the hydrometer, which gives in a ready manner that proportion of escapiug material that can, for the purposes concerned, be regarded as soluble. This refers to the clays or to sand iu exceedingly minute grains. This character of material can be stored only in cases where a period of rest can be secured behind barriers. The period of stagnation is rarely sufficient to absolutely precipitate all suspended material.

To require this would in most cases be equivalent to snppression of hydraulic mining. It is the endeavor of the Commissiou in each case to reduce the escape to a minimum, and each case has its own solution. It will be uoticed tbat the Commissioners have had a trusted watchmau in the field and have used every precaution to prevent illegal mining. It will also be noticed that work performed under their direction has beeu the means of permittiug several mines to be operated, by which a large number of people have fouud employment and a considerable increase made in the outpnt of gold. At the same time there is little if any fault found, because of an increase of slickens in the rivers, and this is why the *Democrat* has favored a reduction of expenses in paying the manager and attorney of the Anti-Debris Assoeiation.

Mexico's Mineral Wealth.

The uumber of mines now being worked in Mexico, according to recent data, is at least 5000, with others worked only at intervals and still others whose operations are hardly worthy of mention. If to these are added the large number of abandoued claims, many of which if reopened would yield importaut returns—even greater in some cases than those now in course of development—the total would reach, according to our chief informant, "incredible figures," while new mines are beiug discovered day by day.

The total amount invested iu the silver mines of Mexico is roughly estimated at $800,000,000, of which not more thau one-eighth is American capital, while only an amount equal to one-third of the latter, or $33,000,000, is British capital. The annual yield of Mexican silver and gold collectively is set down at about $40,000,000. The output of copper figures at about $2,500,000 and of coal at $4,000,000. If we include iron, sulphur, marble, clay, mercury, salt, stone aud metalloids, the estimated annual total of mining products would amount to not less than $65,000,000.

THE new schedule of wages for the Carnegie employes at Homestead gives an average for every man aud boy of $2 20 per day. Last year it was $2.24; in 1893, $2.44; aud in 1882, $2.43. Under this new scale heaters and rollers will average from $5.50 to $7 per day, while common labor will not be reduced.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XVIII.

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The Buena Vista Petrolcum Company was incorporated in February of this year. The oil fields were iu Tulare county, now Kern; they covered an area of 678 acres.

James M. Kenton of Bear valley, Mariposa county, reported to Hon. Samuel Purdy, owner of these lauds, in which he related having sunk two shallow wells some distanee apart, which filled with maltha in one uight.

On January 4th, seventy cans of maltha were shipped to San Francisco from this district by the Buena Vista Petroleum Company.

In 1860 Leonidas Haskell visited this locality with General Fremont. He found "sulphur and salt springs in abundance, but fresh water was scaree. When wells were sunk for water they almost invariably filled up with mineral tar." He was shown a fissure or crack in the earth, caused by an earthquake the year previous, extending for miles, "which in many places was filled with this same tarry suhstance." "The atmosphere was absolutely impregnated with the offensive odor of bitumen for miles around; and it was a common saying with the coasters runuing from San Francisco to southern ports, that they always knew when they were off San Luis Obispo, as well in foggy weather as in clear, by the smell of tar."

I gathered the following early history of the Kern county asphaltum beds from Mr. John Hambleton, whom I met in Bakersfield in May, 1893:

In or about 1861 he was living in Albuquerque, New Mexico, where he met Lieut. E. F. Beale, U. S. surveyor of California, who had information of oil indications in Tulare county, at a very early period. In 1864 Mr. Hambleton was in California, and met Taller and Choyer, Daniel Woodside and Stephen Bond, who, in prospecting in Tulare county, had met with the petroleum indications referred to by Lieut. Beale. He made arrangements with Bond, who returned with him and revealed the locality. The land had been surveyed in townships ouly. Mr. Hambleton selected that portiou on which the oil indications were the most conspicuous, and made a loeation, which he recorded in Visalia. When tbe land was fiually sectionized he relocated his claim according to the new lines. A company was incorporated with the name "Buena Vista Oil Company," of which Stephen Bond was first president.

Soon after, E. Beuoist, a French chemist, was sent to examiue the claims; his report being favorable, he sank a miner's shaft at a point he considered most favorable. This opening was four feet square and eighteeu feet deep, in which considerable thick maltha collected.

Mr. Hambleton verified the statement made by Mr. Haskell as to the fissure made by the earthquake, and said that in some parts of the oil belt, mineral tar rises iu wells sunk for water, aud elsewhere water is covered by a thin film of oil.

Attention was speeially called to certaiu oil iudications at Mattole, Humboldt county, known for several years to exist at that locality; these indications were emanations of gas and seeping of oil on the surface of the ground. An oil belt was seemingly traced from the Mattole river to beyond Cape Mendocino ou the north. It was supposed to be twenty miles long and fifteen wide.

Mr. J. W. Hendersou, now living at Eureka, having heard these facts stated, made an overland trip to the locality from San Francisco; he prospected for two weeks and returned with two gallons of oil as a sample. Soon after, he became associated with Judge Levi Parsons of San Francisco and Thomas A. Scott of Philadelphia. The land being unsurveyed, it was located and held by occupation, pending action by the Land Office.

The Petroleum Oil Works of Santa Cruz had an office, 204 Montgomery street, San Francisco.

1865.—In 1865 the Point Arenas Petroleum Oil and Coal Company had au office in Government House, San Francisco. During the year interest in petroleum in Californuia had increased, until it became an excitement. There was much activity displayed in several sections of the State, mainly in Colusa, Coutra Costa, Humboldt, Los Angeles, Santa Clara and Ventura counties. An opinion prevailed that extensive deposits of petroleum could not exist in the absence of coal beds. This judgment was based ou superficial examinations and the question frequently asked, Who knows that true coal does uot exist below the cretaceous aud tertiary? remained unanswered.

Prof. Wm. P. Blake read a paper before the California Academy of Sciences Feb. 6, referring to the Buena Vista deposits as a new discovery.

Prospecting continued until numerous oil companies were incorporated, and forty or fifty wells were started, mostly in Humboldt county. A tabular statement was published, giviug the uumber of oil companies at seventy, having a collective capital of $50,000,000. Prospecting companies were formed from one end of the State to the other, including

several eastern incorporations, which began to explore in the counties of Santa Barbara, San Luis Obispo and Ventura.

The following are the counties in which operations were most active during this year:

Colusa County.—The oil district in this county was called the "Bear River petroleum district." It was at a locality about a quarter of a mile below Simmons', now Wilber, mineral springs. There were at least twelve companies organized to sink for oil. None met with material success, and during a recent visit to the locality I found no remaining evidence of former workings. Rowe & Fleeson sank a well one mile below Simmons' springs, and the "Antelope Valley and Pioneer Oil Company" commenced operations for the second time.

Contra Costa County.—There was an oil excitement in this county. The "San Pablo Petroleum Company" operated one mile from San Pablo, and a well was sunk in Marsh canyon, southeast of Mount Diablo.

Humboldt County.—Operations of considerable magnitude were undertaken in this county, and there seems to have been sufficient encouragement to warrant it, if published accounts can be relied upon. The principal locality was on Mattole river. Thirty-three companies operated, of which the following were the most prominent and active: Buckeye, Brown & Knowles, Comet, Humboldt Oil Company, Irwin Davis, Mattole Creek Petroleum Company, North Fork Oil Company, Paragon Petroleum Company, Sacramento, and Yosemite.

In the spring, the oil lands of Humboldt county having been surveyed by the Government, Mr. J. W. Henderson and associates purchased 15,000 acres and commenced operations under the name "Joel Flat Company." The usual exaggerated statements were published, which added fuel to the excitement; for example, "Nothing but lack of facilities for transportation prevents large quantities of crude petroleum oil from coming to this market instead of the driblets of a few barrels at a time which we are now receiving." It was also stated that one dollar per gallon was eagerly offered for crude Mattole oil. If it had been quoted at two dollars per barrel it would have been nearer to the real value. It was also widely published that 191 barrels of crude petroleum of 40 gallons each were the product of the Mattole district in October. The following phenomenon is also recorded: On the 3d of August, at the Mattole well of the North Fork Oil Company, a gush of oil rose several feet above the opening. It soon fell, but left the well brim full. The next day the well was pumped out and the same was repeated, which was also the case on the nith and sixth days. Thirty barrels of the oil were shipped to San Francisco. "Six 20-gallon casks of the oil from the Mattole Oil Company was the first shipment of California mineral oil received at San Francisco from the north." Mattole river and the town of Petrolia lie near the sea coast, and about ten miles south of Cape Mendocino. A large oil spring was also said to have been discovered near big head of Mad river. These statements are gleaned from newspapers published at the time. While it is probably true that the accounts were rose-tinted, it is also quite certain that there was real encouragement and that prospects obtained were sufficient to prove that there is mineral oil at this locality, which at some other time, when conditions are more favorable, may be found in paying quantity. When the excitement subsided, which it soon did, work was suspended and was not resumed until quite recently.

Los Angeles County.—The San Fernando petroleum and mining district was organized in June, and C. Leaming was elected recorder. The Los Angeles Petroleum Company sank a well by steam power, which on the 28th of April was down 130 feet. The "San Fernando Petroleum and Mining Company" was incorporated.

Mendocino County.—The "Bolinas Petroleum Company" commenced operations in the Arroya Honda and on the Bolinas ranch. Mr. T. C. Cherry, a Pennsylvania oil operator, came to California to establish an oil refinery. He made a favorable report on the property of the Point Areua Oil Company which commenced operation, but met with but little success.

Nevada County.—Oil is said to have been found oozing from the ground at North San Juan.

San Joaquin County.—The Adams well, at the base of Mount Diablo, acquired considerable celebrity. One statement credited this well with the production of six gallons of oil in March, which sold for $1 per gallon. If it produced more, the yield did not continue, for operations soon ceased and the locality was abandoned.

San Mateo County.—Mineral oil was discovered on Bell's ranch, fifteen miles below Halfmoon bay, and at Purissima creek.

Santa Barbara County.—The "Philadelphia and California" and the "Santa Barbara and California" petroleum companies were incorporated.

Santa Clara County.—A well 135 feet deep was sunk at Lexington by some Portuguese who were prospecting for coal. I was there at the time and saw indications of petroleum. A well at Moody gulch began to produce one barrel of good oil per day.

Santa Cruz County.—The Pennsylvania Petroleum Company commenced operations near the seacoast, six miles south of Santa Cruz.

Tulare County.—In May forty cases of crude oil were sent to San Francisco from the "Pacific and San Joaquin Company's" works at Buena Vista—now Kern county.

Ventura County.—It was stated that in the valley of the San Buenaventura hundreds of barrels of black oil (maltha) had run to waste; some was gathered and sent to San Francisco for treatment. In April, Professor B. Silliman wrote a letter to Hon. D. H. Harris, the publication of which had great influence in stimulating the search for and study of California mineral oils. During this year there was an unusual and I fear an unhealthy excitement as to petroleum in California. It was thought that sinking wells in those localities where indications existed, would surely result in flowing wells such as were at that time quite abundant in Pennsylvania and elsewhere.

(To be Continued.)

As to "Horse Power."

I had the misfortune not long since, says "Inspector," to travel through that part of Indiana where the farmers raise sheep and horses and their sons raise what the late Phil Sheridan preferred to Texas as a place of abode. They were doing it just at that time, for it was during the July unpleasantness at Hammond. A man was sitting near me who in appearance reminded one of Alkali Ike and in ready information of a college professor. I at once sized him up as a civil engineer when he made a chance remark about horse power. I happened to say: "Do you suppose half the people who use that term every day know what it means?" He replied: "No, I don't; and what's more, I think it is one of the most indefinite terms with the most impracticable name that has been tolerated in scientific books. Look out in that pasture now. There's a great big Clydesdale that weighs probably 1500 pounds and another little skinny devil over yonder that weighs scant 900 pounds. Don't tell me that that's a proper unit to rate a steam engine on— Auburn? That's my station. Good bye."

I was sorry the fellow left. His accent indicated that he had been raised in Maine and lowered in Indiana: but his brief closing remark—cut off automatically, as it were—set me thinking, and I felt like thinking aloud for awhile. I knew that a horse power was the work required to raise 33,000 pounds one foot in one minute; but I had sometimes forgotten the time element and knew when riding on street cars and watching loaded drays that each horse was at times doing more than that amount of work. But at this particular time I was impressed with the crudeness of the formula that somebody had thrust upon us and which had been retained for lack of ingenuity to invent a term which would mean scientifically the same thing, but which would have a less number of contradictions in nature, or require less averaging up on the part of the unenlightened in order to arrive at an understanding.

Having this subject in mind, the address of President Henry Morton of the Stevens Institute of Technology, to the last year's graduating class, recently brought to my attention, came to me as a very pleasant assistance. President Morton, among a score or so of "engineering fallacies," which formed the subject of his address, mentioned the common error of failing to recognize a horse power as a *rate* of doing work rather than an *amount* of work done. That is, a horse power is the amount of work a horse is supposed to be capable of doing, not only this hour, but the next, and so on for as many hours as a respectable man will keep a horse at work. The equivaleuts are not calculated for jackasses. However, some of them appear to have been at work upon the other side of the question, for Professor Morton mentions several instances in which the hoary old principle of "conservation of energy," and the adage that "things are not what they seem," are ignored with equal adroitness.

Here, for instance, is an engine using liquefied ammonia in the place of steam. It was made to raise 33,000 pounds one foot high. It took ten minutes to do it, but it was easy to convince an ordinary observer that the machine developed one horse power. As a matter of fact it would take ten of them to do it.

The second example under this head I want to put in President Morton's own words, and it is given for illustrating how easily one may be led to disbelieve the evidence of his own knowledge. These are his words:

"I was asked to test a dynamo machine for which the claim was made that it was many times as efficient as the best Brush or Weston dynamos. I suggested that this was not possible because the above named machines had efficiencies of between eighty and ninety per cent as a theoretical maximum. The reply to this led to the following questions and answers:

"Q. How much power does the ordinary Brush are light require?

"A. About one horse power.

"Q. How does a man power compare with a horse power?

"A. As about one-fifth to one-tenth to one.

"Q. If then one man with the dynamo under discussion can run one Brush are light, will not that prove the machine to be from five to ten times as efficient as a Brush dynamo?

"To this I replied that I would like to see it done.

"In due time there came to hand a large flywheel mounted on a frame, with a pulley for belting to the dynamo and a wheel to turn it by.

"All being arranged, it was found that a strong man could in fact keep up an arc light with this apparatus *for about fifty seconds.*"

But not longer.

The origin of the term "horse power" is somewhat interesting. The first uses of steam engines were to drive machinery for which horses had previously been the motive power. It was therefore quite natural that Boulton and Watt in their early experiments with the steam engine should indicate the capacity of their new machines in units of known powers. They knew by observation that the horses employed around London breweries in draying and in the mining districts in hoisting accomplished about the same amount of work in each working day of eight hours. It also appeared that a horse was working to the best advantage when traveling at the rate of two and one-half miles per hour. It was then easy to ascertain from the different classes of work that at this rate of speed a horse could raise a weight of 150 pounds by means of a rope passed over a pulley. In one minute the weight would be raised 220 feet. By a simple calculation this was reduced to a workable unit in terms of one foot and one minute, giving 33,000 pounds as the result. Since the time of Boulton and Watt this has been the generally accepted unit of power in prime movers, though the French *cheval vapeur* is something over 1000 pounds less.

The time limit again comes up in a different way when we say rashly that a horse can lift 33,000 pounds a foot high by means of a rope passed over a pulley. It would certainly require the accessories of smooth track and light running gear to warrant the expectancy that a horse could draw 16½ tons, to say nothing of lifting a dead weight of that amount. In fact his actual hauling capacity is about one-twentieth of this. The fallacy appears here. If the weight could be raised at all it could probably be as easily done in a second as in a minute. The difficulty arises from the introduction of nature in the shape of a horse into mathematical formulæ. If a hen and a half lay an egg and a half in a day and a half, it opens up pleasing possibilities in the way of mathematics to reduce the result to known terms. But nature abhors the sight of half a hen laying a half egg.

Tin Mines of West Australia.

A practical miner who recently visited the tin fields at Green Bushes, West Australia, gives the following account of operations:

"The ground previous to my going there was all held by companies under leases, but in consequence of an amendment in the mining laws enforcing the labor conditions, they were all abandoned and taken up by individual miners, and worked under mineral licenses which cost 10s. each per year. Each license entitles the holder to four chains by four chains of ground. Generally two men amalgamate two claims by paying a fee of 5s. to the registrar. It is mostly shallow sinking, from 8 feet or 9 feet to 20 feet. All the dirt requires to be puddled in puddling machines, and then sluiced in sluice boxes. After that the tin requires to be streamed until it is quite clean and free from sand. It is then dried in a shed on an iron plate over a fire, and then put in canvas bags—about 1 cwt. in a bag. It is then sent to Sydney, through the agency of the bank, to be smelted and sold. There are no smelting works for tin in Western Australia, Adelaide or Melbourne. It costs 25s. per ton to ship the tin to Sydney. All charges included, it costs about £3 15s. per ton to get the tin to Sydney. Seventy per cent is standard tin. At the present time it is worth about £42 per ton in Sydney. It is sold subject to assay value. There are about 100 miners employed on an average on the field, and the produce amounts to from 250 to 300 tons yearly. It is only a small field and has been open for about five years. There is another tin field in the northwest at the Shaw river. It has already produced about 250 tons of tin. The miners on the tin fields generally made fair wages."

"THE CYANIDE PROCESS; ITS PRACTICAL APPLICATION AND ECONOMICAL RESULTS," is the title of Bulletin No. 5 issued by the State Mining Bureau, a pamphlet of 135 pages, written and compiled by Dr. A. Scheidel, E. M., being an account of the methods employed in the application of the cyanide process in extracting gold and silver from ores in all parts of the world. It is a compendium of up-to-date information on this subject and is of practical value, for there is very little theory, the volume being devoted to telling what the process is, what it costs, and how it can be best handled—just such a treatise as a man interested in the matter in any way wants to get. It may be had upon application to the California State Mining Bureau, Pioneer Building, San Francisco, Cal. Non-residents should send 6 cents postage.

Scientific Progress.

Value of Water Power as Source of Energy.

Owners of water privileges are beginning to realize the fact that the value of water power as a sonrce of energy has been greatly enhanced since the introduction of electrical transmission.

Under proper conditions water is the cheapest source of energy known. It only requires to be controlled by dams, flumes and other devices, to regulate the volume of water supplied to the wheel. The running expenses are merely nominal, as the source of energy is supplied by nature and is always at hand, and the water wheel, if properly constructed and properly placed, requires practically no repairs, no skilled attendants and attention. Regulators and governors are now made which render it possible to give as great steadiness to this form of power as the steam engine gives; and by the use of electricity the power can he transmitted long distances with but a fractional loss of energy.

The great improvements in the steam engine during the past quarter of a century necessitated corresponding improvements in the water wheel, and the inventive genius of the water-wheel makers came to the rescue. In 1804 a patent was issued to Benjamin Tyler of New Hampshire for a "wry fly" wheel, which was based on some of the principles of the modern turbine. This wheel was not used, however, and the real history of the turbine dates from the invention of Fourneyron, who installed the first one in France in 1827. This wheel was small, and was tested under a low head of water, but developed surprising capacity. Power is generated first by utilizing the weight of the water, as in the overshot wheel; second, by the impact of the water, as in the modern turbine or the undershot wheel; and third, by a combination of these two, as in the breast wheel. There should also he added to these the reaction or recoil of the water, which is now made use of in the best designed turbines and impact wheels.

The main point of difference in turbines is the manner in which the water is received aud discharged. The water may he received on top of the buckets or on the sides, and the discharge may he outward or side, downward and inward or central. Fourneyron made use of both impact and reaction, and his wheel was of the side or outward discharge type. There are to-day hundreds of thousands of horse-power running to waste in the rivers and waterways of this country, because of their remoteness from industrial centers, and of the open question of economy of long-distance electric transmissions. But it is only a question of a short time when owners of privileges on these streams shall realize very handsome profits by transforming this latent power into electricity by means of water wheels. Even with the present knowledge of electric transmission, most of these water privileges could be used to generate cheap electricity for lighting neighboring towns and operating electric railways.

Hydraulic engineers claim that water power per horse power should cost, on an average, considerably less than steam power, and the Niagara company evidently believe that this is approximately true when it is reported as offering to deliver in Buffalo and adjoining centers electricity generated at its great plant by the water of Niagara, for $15 or less per horse power per year when units of considerable size are called for.

The greatest obstacle which is encountered in the successful operation of water wheels, from an economical point of view, is that there is too often an entire absence of employment of engineering skill in utilizing the power. Many a water power would develop a greater efficiency had it been properly controlled, and had the turbine been selected because of its adaptability to the conditions and been properly set.

When first introduced turbines were used singly. Now, however, they are used either singly or in sets of two or three or more, as expedient, and in batteries of sets; and by the use of iron or steel penstocks and feed pipes the expense of installing has been largely reduced and much greater economy in the use of water secured. The growing demand for large units of power has been satisfied, so that whereas a few years ago a 500-horse power turbine was almost unheard of, to-day turbines of 5000-horse power have been introduced.

How the Mind is Affected by the Weather.

The psychology of the weather is suggested by Dr. T. D. Crothers as a promising subject for study. He says: "Very few persons recognize the sources of error that come directly from atmospheric conditions on experimenters and observers and others. In my own case I have been amazed at the faulty deductions and misconceptions which were made in damp, foggy weather, or on days in which the air was charged with electricity and thunder storms were impending. What seemed clear to me at these times appeared later to he filled with error. An actuary in a large insurance company is obliged to stop work at such times, finding that he makes so many mistakes which he is only conscious of later that his work is useless. In a large factory from ten to twenty per cent less work is brought out on damp days and days of threatening storm. The superintendent, in receiving orders to be delivered at a certain time, takes this factor into calculation. There is a theory among many persons in the fire insurance business that in states of depressing atmosphere greater carelessness exists and more fires follow. Engineers of railway locomotives have some curious theories of trouble, accidents and increased dangers in such periods, attributing them to the machinery." Dr. Crothers adds that the conviction prevails among many active brain workers in his circle that some very powerful forces coming from what is popularly called the weather, control the work and the success of each one.

Theory of the Tides.

No theory of the tides has been offered which gives entire satisfaction to all scientists, but the one generally accepted is this: The moon, acting alone, would not only raise a wave on the side of the earth nearest to it, by gravitation, but would also draw the earth itself far enough out of its course to leave behind some of the water on the further side; which water would then be raised relatively to the earth's surface, and constitute the second tidal wave. The sun alone would act similarly, although its tide-raising effect is only about two-fifths that of the moon. At new moon the sun and moon pull together and give higher tides than at the first and third quarters, when the sun draws its right angles to the line of the moon's attraction. At full moon, when the sun is on the opposite side of the earth from the moon, virtually the same effect is observed as at new moon. The outer of the solid earth would not at that time he shifted to one side, but the double tide-raising action of the sun would again be super-imposed on that of the moon and give tides on opposite sides as high as those a fortnight before.

AN AERIAL WIRE ROPEWAY on the Bleichert system has been erected at the gold mine on the Joe's Luck and Bon Accord Company, near Barberton, East Africa. The horizontal distance from the mine to the mill is 2,584.59 yards, the total length of the ropeway itself being 2,701,286 yards. The total fall of the line is 1,586.31 feet, the steepest gradient being 53 per cent, and the longest span being 813.67 feet. The transport capacity of the line, as fixed by the company is 42 tons of quartz per day, with a hauling rope speed of 295.2 feet per minute.

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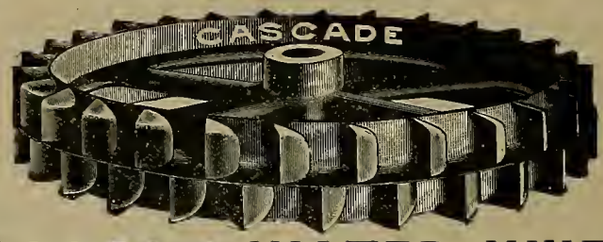
SNYDER MINE, KENNETT, CAL. In reply to inquiry as to how Tramway is doing, am prepared to state that it has given ENTIRE SATISFACTION IN EVERY PARTICULAR. JUDKINS TRAMWAY CO., POMEROY, WASH.

It will give us great pleasure to recommend your Ropeway and your Company as well to any persons who may be thinking of erecting Ropeways.

SAN ANDREAS, DURANGO, MEXICO, March, 20, 1894. I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation. ANTONIO H. PAREDES, Director S. A. de la S. M. Co.

Vulcan Iron Works,
135-145 Fremont St., San Francisco.

WATER  WHEEL

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Mechanical Progress.

Manufacture of Circular Saws.

Circular saws are now made from cast steel, specially manufactured for the purpose, the metal being cast in ingots of various sizes, depending on the size of the saw required. When the manufacture of a saw is commenced one of these ingots is placed in a large furnace, brought to the desired heat, and while hot passed through powerful rolls, which gradually reduce it to the required thickness. The plate is then centered and scribed round to mark the shape of the circle, and passed to the shearer, who cuts it into a circular shape; the center hole is then bored.

It is next handed over to the toother, who punches or flays out the teeth round the edge (this leaves the proper shape of the teeth standing up prominently); they are afterward roughly filed or ground with emery wheels to take off the burr caused by the heating.

The rough saw is now again heated in a large furnace, something like a baker's oven, until it becomes of a bright red color. It is then taken out, and while hot plunged in a bath of sperm oil, which renders it hard and brittle. After being withdrawn from the bath the oil is partly cleaned off and it is returned to the furnace, where it is allowed to remain until the remainder of the oil has been burned off, this process giving the saw the required temper and rendering it tough. When the tempering process is completed the plate is allowed to cool, and then taken in hand by the hammerman, and hammered on a steel-faced anvil until it becomes straight.

The saw is next ground by being caused to revolve in a perpendicular position between two large grindstones, which themselves also revolve in a contrary directiou; it is afterwards polished with emery ou a large revolving disk, and once more passes into the hands of the hammer-men, who strike it with smooth-faced hammers on an anvil, as before, until it is absolutely straight and true and has acquired the proper tension which allows for expansion while the saw is revolving at work. The teeth are now set, to allow for clearance when at work sawing timber, the teeth being slightly bent alternately to the right and left. The saws are afterward sharpened by being filed on front and top of teeth, this operation completing their manufacture.

TESTS have recently been made to determine the loss of heat from steam pipes due to radiation, three distinct conditions being observed, namely, bare pipes, pipes covered with one inch of composition, and pipes covered with one inch of composition and three layers of hair felt, each half an inch in thickness. The steam pressure used was from forty-five to sixty pounds, and the results showed that with one inch of composition out of a possible loss of 100 per cent 83¼ per cent was saved, and with the extra felt covering 8¼ per cent additional was saved. It is stated that if one pound of coal is required to evaporate eight pounds of water into steam at sixty pounds pressure then six and one-half hundredweight of coal would be needed every year to make good the loss of heat for every square foot of uncovered steam pipe.

ON the three hours' trial trip of the English torpedo boat destroyer Ferret, the wonderful speed of 27.51 knots is said to have been developed. This is nearly equal to 31.7 miles per hour, which is higher than the average speed of many express traius. The Ferret is 194 feet long and 19 feet 3 inches beam, with a draught of 5 feet, her displacement being 220 tons. The engines are of the triple expansion type, the cylinders being 19.29, and 43 inches by 18 inches stroke.

A LITTLE STEAMER of a hundred tons is at present being constructed at Argenteuil, according to the invention of M. Bazin, which consists of rolliug the ship over the water instead of forcing it through as at present. To this end a number of enormous copper cylinders are fixed to the vessel, the speed attained depending on the speed of the copper cylinders, and it is computed that thirty-one knots an hour can be easily made. The steering is done by a kind of hydraulic pump, and an advantage claimed is that no way is lost in altering the course. It is hoped that the vessel will be built without loss of time. The trial trip will be made between Dieppe and Newhaven.

Bells.

Bell making is one of the great industries in this country, yet how seldom we hear of it. Foreign countries recognize that our bells are superior in tone to any other make, and even the Japanese are sending orders to this country for bells. The Japanese have long been regarded as famous bell makers, but they do not hesitate to apply to American manufacturers when they find it to their advantage to do so. There is grim humor in the fact that the fire-alarm bells to be used in Tokio have been ordered of a manufacturing firm in Jersey City.

The largest bell in America is in the cathedral of Montreal, and it weighs 28,000 pounds. The bell iu the public building at Philadelphia is to weigh between 20,000 and 25,000 pounds. There is a bell at Erfurt, Germany, cast in 1479, and one in Notre Dame, Paris, cast in 1860, each weighing 30,000 pounds. The great Chinese bell at Pekin weighs 120,000 pouuds, is 14 feet high and 12 feet in diameter. By the way, the Chinese used to make their bells nearly square in shape. The largest bell is, of course, that in the Kremlin at Moscow. It is over 19 feet in height and measures nearly 23 feet across the mouth. Its thickness at the point where the clapper would strike is 23 inches; the cost of manufacturing this work of art was about $300,000.

Cost to Make Steel Rails.

A writer in the *Iron and Coal Trades Review* says: "I believe I am not betraying any secret when I state that at the present range of prices for raw materials, and at the existing price for American labor, Mr. Carnegie can manufacture steel rails for a good deal under $20 per ton. He does not, however, find it necessary to sell at that price. Indeed, a number of the leading buyers in the United States are not much concerned to have prices cut very low. Importaut railway corporations, for instance, prefer to feed the works on their several systems, and if those works cannot execute the order at one price they must just quote another. Hence the firm that cuts prices is not always the most successful."

IF Congressman Livingston can secure enough votes there will be no more "waste of powder" for informing people in the neighborhood of the various posts of the Army that "the sun has risen," or "it's sundown." He objected to a clause in the Army Appropriation bill a few days ago providing for "$20,000 for firing the morning and evening gun at military posts" as an unnecessary waste of powder. "My question is," he said, "What is the practicability of it? What is the advantage of it either to the country or to the Army? If the Lord says when the sun shall go down, I want to know how much advantage this gun is to the country?"

A SCOTCH ENGINEER writes that the white light for safety signal on railways is being replaced by greeu; this is a precautionary measure to avoid the risk rising from the possibility of the red glass of danger signals being broken or blown out aud thus the light being mistaken for a white one, which, under the former system, would have meaut a probable collision. The North British railway, of Scotland, is said to be spending $85,000 iu making this change from white to green, so it is evident that a strong feeliug exists concerniug the dauger of the old system.

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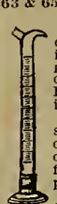
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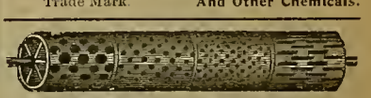
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

El Dorado.

A HORSESHOE BEND FOR LUCK.—Placerville *Democrat:* The Linden Gold Mining Company is doing a slugging business. Its great gravel mine on Cedar Ravine takes in a crooked channel, forming a labyrinth of loops and horseshoe bends. Through it as a basis for future workings, a tunnel has been run between three and four thousand feet. It has confirmed the favorable opinions of mining experts and been full of encouraging surprises. The latest of them within the last two weeks, was twelve pounds and ten ounces of slug gold, from a run of five days.

Mariposa.

AMONG THE MINES.—*Gazette:* New mining sales are reported from different parts of the county. In the Coulterville district there is greater interest manifested in securing mines than on this side, and several quite important deals have been made recently. Capt. A. H. Ward has purchased the Williams & Morris mine, and is busy developing his group, most of which have been partially tested.

The Virginia mine, which a few years ago was successfully worked, has also changed hands.

Work on the Red Cloud progresses steadily, and before the spring is over some good results are expected from this well-known mine. The superintendent, Mr. Whitcomb, is managing carefully and is confident of success.

New machinery is being put in at the Tyro mine, and work will soon commence.

An important deal in the Whitlock district has just been consummated. J. J. Ellingham has bonded the Farmer's Hope mine and mill to the members of the old Enterprise Mining company. The Enterprise will be recalled as the Madera county mine which yielded $16,000 per week in its palmy days, but has now been worked out. The new company has taken possession of the Farmer's Hope and will at once proceed to test this promising property.

The Sierra Butte company is pushing work steadily at the Whitlock mine, both on the new mill and the mine, and before many months will be taking out the yellow metal in large quantities.

The abundant rains have set the placer miners to work and in every gulch and on every hillside around Mariposa men may be seen ground sluicing and panning and the experienced workers are securing good results.

Mono.

Bodie *Miner:* Work has started up at Green Creek again. The men are engaged in putting a new foundation under the receiver, and digging a long trench for the permanent draining of water-wheel and dynamo foundation work in the power-house. The capacity of the Green Creek reservoir will be about nineteen and a half million gallons.

In the Bodie the south drifts twenty feet above No. 1 west crosscut 400 level was extended fourteen feet; face in porphyry with a small seam of ore. North drift from winze twenty-two feet below the main north drift 300 level was extended eleven feet. The ore in the face is from twelve to fourteen inches wide and of very good grade. East crosscut from Burgess winze level fifty feet below the 200 level was extended eight feet; face in porphyry. Hoisted to the surface thirteen tons of ore estimated at $40 per ton.

Nevada.

RICH ORE.—Thomas & Co., lessees of the New York Consolidated mine on Mosquito creek, have out on their dump thirteen tons of quartz that yield, over $40 per ton, says the *Transcript.* The rock is worked at Maltman & Thompson's reduction works, near Grass Valley, being crushed dry and then treated by the chlorination process. The Niagara mine, which adjoins the New York Consolidated, is being worked and the prospects are very encouraging. A two-foot ledge has been struck and it is improving in appearance as the shaft gets deeper.

Shasta.

Press: The Iron Mountain sale is the all-absorbing topic in Shasta, and bets are about even whether its on or off. The last expert on the ground, a Mr. Hill, from the Rio Tinto of Spain, pronounces it more extensive than that famous mine, while the ores of Iron Mountain carry ten times the value in gold and silver, making it the most valuable copper, gold and silver mine in the world. Mr. Hill is an up-to-date metallurgist, and proposes to use the late improved pyritic processes of smelting.

In the French Gulch district, the Lowdon mill is running on custom ore. The Ellery claim continues to improve with development work. Prof. Morton reports eighteen men at work on the Myers property, with a fine showing of high-grade ore. The Washington people are again talking of a sale to a New York syndicate.

James Sallee is going to put on a steam pump and hoist on the Upper Springs. Mr. Samonai at the Gem mill is working some ore and testing the new concentrators. The latter seem to be wholly an experiment, the inventors trying to adopt them to the Shasta county ores.

Siskiyou.

GENERAL MINING NOTES.—*Journal:* Austin & Co., of the Greenhorn Blue Gravel Mine, about a mile south of Yreka, took out a nugget weighing $55 last week, and are working very rich ground at present. Owing to snow not melting much in the mountains, on account of the cool nights, the water supply is rather limited, and there is no water coming down from the creek. There is plenty to come however, when the weather is warm or warm rains occur, as the Humbug and Deadwood range is covered with from four to six feet of snow.

The hydraulic miners at Quartz Valley, Oro Fino, Salmon River, Cottonwood, Humbug, South Fork of Scott River and all along the Klamath river are doing good work, in piping the banks with giants, with expectation of doing still better when the weather becomes warmer, to melt the snow faster. The water supply for hydraulic mining this season it likely to last longer next summer than any year yet known, as the snow seems to have all bunched into the districts above 4,000 feet altitude, just where it is needed for the greatest benefit for mining purposes. The miners at Hawkinsville are all doing well this season, with better times ahead, and there is an abundance of snow to supply Canal and Long Gulches with an abundant supply of water for a long time, and the same may be said of Humbug Gulch coming down on Yreka Flats, and Greenhorn Creek, a little south of Yreka.

The recent heavy rain has afforded an abundance of water for mining, to permit continuance of operations right along full handed, in the various hydraulic and placer mining claims, and also plenty of water power to start quartz mills. River mining will probably be suspended, as the streams are too high, and most of the claims are filled up with water, to require pulling out the apparatus, or not advisable to pump out before spring until the danger of heavy freshets is over.

Jillson & Co. intend putting up a new quartz mill of five stamps at their blue gravel mine near Henely, for crushing the blue cement and gravel taken out, as the best means of securing the gold it contains. They have heretofore been using an arrastra, which does not break up the gravel to good advantage.

NEVADA.

Esmeralda.

A GOOD MINING DISTRICT.—Advices from the Silver Star mining district are to the effect that everything there looks bright and prosperous. The little mill recently erected is continually at work, and there is ore enough on the dumps to keep it running for the next year. The Hardscrabble mine keeps to the front. The owner is reported to have refused $120,000 for it. Other mines in the district are yielding good ore.

A BRIGHT OUTLOOK—Frank Robb, who has been engaged in erecting a mill building at the new mining district in Esmeralda county, is very enthusiastic over the outlook in the district and says it surpasses anything in the mining line he has ever seen. The principal mine is owned by Ed Brown, in which, he says, there is $150,000 in sight and no sign of a let-up to the ledge. The workings are not deep, the main shaft being down about 190 feet. Rich ore was taken out from the grass roots to the bottom. Good ore is being taken from several other claims in the district, and Mr. Robb thinks that all indications Silver Star District is destined to create a big stir.

Storey.

In the Savage on the 1000 level they continue to extract ore from the sill floor in the north lateral drift from the east drift up to the 9th floor. On the 1050 level in the south drift from the east drift thirty feet from the south ore stopes they continue to extract ore of fair grade. They are still stoping ore from the bottom of the winze in the south drift. They have drifted north fourteen feet on the streak of ore mentioned in the last weekly report as encountered in the east crosscut from the south drift.

ARIZONA.

FOREMAN ALMOST CRAZY.—*Star:* A Mexican from the Mineral Group, a copper property near San Xavier, owned by Messrs. Hughes and Banes, says that a big and wonderfully rich lead of copper ores had been struck that day in the mines, and that the foreman had about gone crazy over the rich discovery. This property was bonded some time ago by the International Copper Company of El Paso, who have at this present time forty men at work on the mines. Several large shipments of ore have already been made to Texas.

The Mohawk mine at Mammoth will be in full operation, mill and all, by the 1st of June. Superintendent Bailey is letting a contract for a drift of 275 feet along the ore. This will connect the two shafts and get air supply. A total of three miles of piping will connect the mill with the San Pedro river. Pumping to the mill and various means of conveying the ore from the mine to the river have been carefully calculated on, and pumping is considered the most economical. A pump that will be the pioneer of its kind will be put in. It will throw water stronger than any other make, if it keeps up the expectations.

MEXICO.

The old duty on lead ores was a cent and a half a pound; the present duty is three-fourths of a cent a pound. There has been a very marked increase in the shipment of ores from Mexico, but not, as might be supposed, from the reduction of duty in the ores. Heretofore the mine owners have hoped that some legislation favorable to silver would occur, and for this they have vainly hoped and waited. Now they see they have no prospects in that regard, so they ship the ores they have, and make what they can with silver as it is. The ready money is needed, and if not what they can obtain is accepted. Mexican dollars are now 49 in Nogales, so that goods there were never marked higher than they are at present.

OREGON.

JOSEPHINE CO.—Major Newell has hung up his gold-pumping boat for awhile and gone to Portland where he will negotiate for a larger boiler and more powerful pumping apparatus. The Major is still confident of the success of his scheme.

WASHINGTON.

The following is furnished by the secretary of the Tacoma Chamber of Commerce:

REPORT OF TACOMA SMELTER FOR THE MONTH OF DECEMBER, 1894.

Number of men employed	64
Pay roll	$5,180 36
Wood choppers and wood haulers	468 00
Total	$5,648 36

PRODUCT.

2800 bars bullion weighing	290,884 lbs.
Copper matte "	105,100 lbs.

Contents.

1,165.85 ozs. gold	@ $20 67		$24,098 12
26,375.52 ozs. silver	@ 61		16,089 06
289,394 lbs. lead	@ 03		8,681 82
52,550 lbs. copper	@ 09½		4,992 25
Total output			$53,861 25

OKLAHOMA.

A Guthrie dispatch says: Hundreds of prospectors are swarming into the Wichita mountains, in the Kiowa and Comanche Indian reservation, caused by the discovery of deposits of gold and silver. Troops have been ordered from Fort Reno to eject them, and serious trouble is looked for, as the prospectors declare they have a right in the mountains under the mining laws, and will not leave. Many samples of ore have been brought out for assay.

Coast Industrial Notes.

—The Eureka Electric Storage Battery Co. has removed to commodious quarters at 645 Mission St.

—Southern California is now daily producing over seventeen hundred barrels of petroleum.

—A Tacoma, Wash., dispatch says all the logging camps will start up in that State within a week.

—The Portland, Or., 5 per cent water bonds have been sold to E. & S. Ellis of this city at a premium of $11,000.

—The city of San Diego has offered $600,000 for the plant of the San Diego Water Company. The offer has been declined.

—During December the Everett, Wash., smelter shipped bullion to the amount of $107,000. The product for the month included 3,000 ounces of gold, 60,000 ounces of silver and 500,000 pounds of lead. It has since closed down.

—There are over a thousand laborers working with scrapers and shovels on the Yaqui canal, Sonora, Mexico, besides those employed on the dredge. The canal is expected to be finished by April, and the dam will be constructed in May.

—The steamer Australia is being cleaned and painted at the hydraulic dock of the Union Iron Works. She will be succeeded by the steamer State of California, which will have her broken shaft removed and replaced and other repairs made.

—At the recent sale of the Hudson Bay Company in London the highest price brought was 35s a seal skin the average was 30s. There is a blue lot of sealing men in Alaska. The news was a complete surprise, for never have skins sold so low in the history of the Bering sea industry.

—Lieut. Dorn and Engineer Mallison leave New York next Monday via Panama in charge of 70 petty officers and sailors which will form the nucleus of the cruiser Olympia's company. The Union Iron Works will complete the vessel as fast as the required material is furnished. She will be the flagship of the Pacific station; it is thought Capt. Reed will have command.

—Captain J. A. Mellon is having two boats built here which he will take by rail to Green River, Wyo., in April, and, assisted by river men, will descend the Colorado river to Yuma and the Gulf of California. Captain Mellon has been running steamers on the Colorado river thirty-two years. He is a resident of Yuma, Ariz., and proposes to make the trip of 3000 miles in seventeen days.

—D. Freeman, president of the Los Angeles Chamber of Commerce, the past year writes: "We are still suffering from underproduction in the very necessities of life. When it takes a train of cars nearly a mile long to bring into this State the eggs that the enterprising hens of Kansas and Iowa lay for us, and when we import annually over 4,000 carloads of bacon, poultry, dried fruits and other products, to the value of $8,000,000, that could be raised here, let no one croak about overdoing things in this country."

—In Orange Co. the Union Oil Company has begun sinking wells five miles north of Fullerton and adjoining the Puente wells on the west. The company has over eleven hundred acres of land east of the Puente wells, which it purchased from the Stearns Ranchos Company, a year ago. The Puente Oil Company is securing the right-of-way for its pipe line to Fullerton, and it is the intention of the Santa Fe Company to make this town the oiling station for their engines, as that is the only point on their line that oil can be piped to.

—During last summer $12,000 worth of new machinery and apparatus has been purchased and installed at the Throop Polytechnic Institute, Pasadena. This includes additions to chemical, physical, electrical, and biological equipments, a new steam plant, complete pattern shop outfit, a complete machine shop outfit, and a Sloyd school equipment. The total value of the equipment, at present, amounts to about $100,000. A class has been organized and is now pursuing a course of training in Sloyd work. A department of accounts, stenography and type-writing provides business training. The department of art offers excellent facilities in both painting and drawing. There have been valuable accessions to the libraries located in the several departments.

—The Snoqualmie Falls Electric Power Co., State of Washington, has acquired 350 acres of land on both sides of the Snoqualmie river, and an option on as much more land adjoining. The theoretical energy of the falls is 51,607-horse power. The plans of the company are to develop and deliver by electrical transmission, power for factories, lighting, heating, etc. A contract has been arranged with the Union Electric Company of Seattle to have the company furnish them with its power entirely; the price charged per horse power being $30. The capital stock is 20,000 shares of $100.

—Nearly 100 new buildings are to be built this year at the Presidio, to be occupied as barracks, built of brick and stone and inclosed by a stone wall. They represent an aggregate cost of about $300,000. Seven brick stables, costing about $110,000, will also be built. An administration building to cost $50,000, and forty brick and stone buildings, to cost in the aggregate $200,000, a stone wall to include a large part of the reservation, the improvement of the grounds and other minor changes, aggregate up to $1,000,000 in total. The contract for one barrack building, to cost $40,000 has been awarded. The second building is to be finished by next July. The department is now receiving bids for the stone wall and will soon receive bids for the work of filling in the parade ground, macadamizing etc.

—The rivers of the Pacific coast formerly contained no shad, but in 1876 the fish commission carried a quantity of shad fry across the country and placed them in the Columbia and other rivers. The fish propagated to such an extent that in 1892 the number of shad caught on the coast of California was 526,424, and 212,350 more was taken in the Columbia river. The total catch of shad for 1892 on the Pacific coast was in excess of the number caught off Connecticut, Rhode Island and Massachusetts, and it nearly equaled the catch of South Carolina. Though the total catch of shad on the Pacific coast is at present very small in comparison with that of the Atlantic seaboard, their rapid multiplication since they were placed in the rivers of California, Oregon and Washington renders it not unlikely that in the near future they may be more plentiful on the Pacific than on the Atlantic coast. This is one of the most interesting results so far recorded of the work of the government fish commission.

The Geographical Society of the Pacific.

The annual meeting and election of this society took place at the rooms, Mercantile Library building, on the 15th inst. For 1895 the following officers were elected:

Directors—Prof. George Davidson, U. S. Coast Survey; Charles L. Taylor, Harry Durbrow, John Partridge, E. J. Bowen, Louis L. Nelson, John Dolbeer.

Councillors—Hon. Ralph C. Harrison, Mark Sheldon, William Hood, Hon. Charles Goodall, James F. Houghton, Gustave Niebaum, Hon. George C. Perkins, Henry Lund, Irving M. Scott, Hon. Jeremiah Lynch, Adolph Sutro, F. Stevens Cook, M. D.

The directors selected the following officers: President, Geo. Davidson, Sc. D., Ph. D.; vice-presidents, Hon. Ralph C. Harrison, Col. Chas. L. Taylor, Irving M. Scott; treasurer, Harry Durbrow; corresponding secretary, Hon. Jeremiah Lynch; recording secretary, John Partridge; assistant secretary, T. F. Trenor, A. M.

The report of the council showed the work done and the papers read in 1894. Hon. Jeremiah Lynch's paper on the late discoveries in Egypt, expected in November, was assigned to a later date. Professor Schaeberle, of the Lick Observatory, will be invited to make his address this month.

The library has largely increased during the past year. Many handsome volumes have been presented, and maps have been added, suitable for the lecture room. The conference held by the society last May at the Midwinter Fair attracted general attention from Eastern and European geographers. A number of the papers then sent in, and which there was not time to read, will be given at future meetings, by consent of the authors.

A WACTHMAKER in Geneva proposes to make a chronometer which will speak, instead of ringing, the time, when the button is pressed. He has devoted a great deal of patient study to his invention, the speaking process being produced by means of a small revolving phonographic plate in which presses a small piece of steel. The vibrations resulting give rise to words denoting the exact time.

Incompetent Steamship Inspection.

The *American Machinist* says the steamer Kewecnaw, lost with all hands in a gale, was one of the vessels built on the Lakes which on first arriving at San Francisco. was a nine-days' wonder to the engineers and seamen of the coast.

The boilers, without proper end mau and hand holes for inspection and cleaning, had been driven at high pressure on salt water during the voyage around the Horn, and in consequence were completely coated internally with a heavy non-conducting scale, aud several of the corrugated furnaces had collapsed by reason of overheating.

Cast-iron engine columns, cracked completely across, were patched with slips of boiler plate tacked on by a few ½-inch or ⅝-inch tap bolts, and those who saw the machinery were forced to wonder what kept the entire plant from lifting bodily skyward when steam was turned on. The oiling gear was *tied* to the rods, links, etc., by pieces of wire and *common twine*, and bore the appearance of having been culled from some scrap heap, the leads of piping being so small that they must have gummed up completely after a day or two of running.

The hulls, built of light scantlings, were continually undergoing repairs; rudder posts and stern framing broken or wrenched while voyaging in the ordinary weather of the Pacific, where what would be considered on the Atlantic seaboard as a moderate blow, is looked upon as a serious hurricane.

From time to time criticism of the men and methods employed in the inspection of steam vessels appears in various quarters, but there has been no concerted action taken to impress upon officials their responsibility for loss of life at sea where this is due to neglect of proper precautions on the part of builders, owners or commanders.

Unless steamship inspectors are men of integrity, experience and skill, the government supervision of vessels becomes a farce, for few of those financially interested will go to the expense to improve machinery or hulls, so long as the local inspector will allow inferior constructions to pass muster.

The notion that captains or engineers will report matters if the ship is unseaworthy or the engines defective is held only by those who are unacquainted with steamboating. In a great majority of cases, the employe of a company, who should condemn the corporation's holdings, would quickly find himself without a berth, whatever might be the truth of his report.

If the traveling public is to be protected, instead of the political generals and ward heelers too often in charge of inspection, men of acknowledged ability in their calling should be substituted. A radical change is absolutely necessary, for the present state of affairs is a national disgrace. Steamers totally unseaworthy, half manned and half equipped are allowed to put to sea by the political hacks, who, by reason of ability to answer set questions in amateur mechanics, are furnished a license by the civil service boards to pass upon matters involving daily risks to thousands of human lives.

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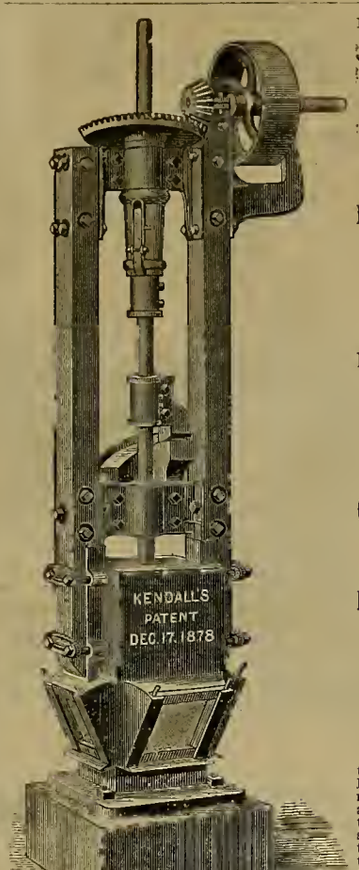

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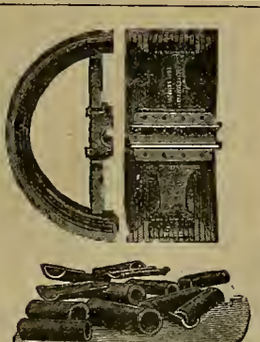

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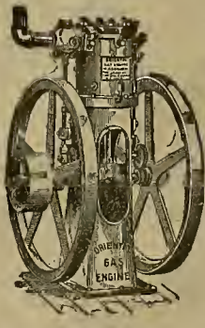

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Electrical Progress.

Electricity on Shipboard.

At the second annual meeting of the Society of Naval Architects in New York, last month, an able and interesting paper on "Electricity on Shipboard" was read. The author, S. Dana Greene, late ensign United States Navy, pointed out the rapid march which has been made during the past decade in the development of electricity on shipboard, and says that this agency has become recognized and standardized so that it can be relied upon for continual and active service. As a result there have been developed for marine work a special type of generating set (engine and dynamo), special appliances (switches, junction boxes, cut-outs, stuffing tubes, water-tight globes and lanterns, etc), special insulation for conductors, special methods of wiring, special forms of searchlights, and special men who may properly be called "marine electricians." These apparatus and appliances differ materially from those in use on shore, and must be used under service conditions entirely dissimilar. Salt water, salt air, steam and the excessive heat of ship boiler and engine rooms, would play havoc in a very short time with the best modern shore insulation, as they have with many of the early ship plants, and if there is any place in the engineering world where the old axiom of "penny wise and pound foolish" should be stamped in large letters, it is on the plans of an electric marine plant.

The uses to which electricity is now being put on board ship are numerous and in naval vessels it has become an absolute necessity, while in freight and passenger steamers and high-class yachts it is also universally applied. Aside from many mechanical uses, electricity as applied in navigational features has become invaluable, prominently so when turned into the searchlight, electric logs, the electric steering compass, means of communication between the various officers and parts of large vessels, signalling and firing circuits, as well as being used as a range or position finder.

Relative to the electric log Ensign Greene points out that the French navy has recently adopted one, the invention of Rear-Admiral Fleuriais. A set of revolving vanes on the log impart, through worm gearing, motion to an ivory disk mounted in the log, and a spring makes contact with metallic plates placed at intervals on the rim of this disk. As this contact takes place, a bell is sounded aboard ship, once for every twenty-four revolutions of the vanes. The intervals between signals is arranged 11 seconds for 8 knots, 8.8 seconds for ten knots, 4.4 seconds for 20 knots, and is, therefore, of sufficient length to prevent error. To indicate fractions of a second, the usual sand-glass has been displaced by a pendulum indicator which beats at intervals of two tenths of a second, and which is started at the moment of taking an observation. A mistake of half a second, with a period of 50 seconds, makes an error of only one-tenth of a knot in the speed of the vessel; if the observation is prolonged, the error is reduced. The apparatus is simple and apparently gives good satisfaction. The log is about 9¾ inches in diameter and is not watertight. Another French invention, by Lieutenant Bersier, French navy, which will probably be introduced aboard ship, is the steering compass. Its object is to keep a ship on her course automatically and without the constant manipulation of the wheel in the hands of the helmsman. The following brief description of the device is taken from a recent technical journal. The electric spark of a Ruhmkorff coil is made to unite a pointer on the circumference of the compass card with either one of two semi-cylindrical, metallic plates, which are electrically insulated from each other and from the side of the compass box of binnacle. The coil is placed a few yards from the compass and is supplied by an alternating current of from two to three amperes. The induced current of the secondary coil reaches the pivot of the compass, through a flexible wire, and passes thence to the aluminum capsule that carries the sapphire, and follows along an aluminum wire or pointer which forms a radius of the north pole of the compass. As the ship deviates to the right or left of her course, the current leaps (through a distance of about an inch) from the pointer to the right or left hand insulated plate in the binnacle, and thence flows through one of two electro magnets, which, in turn, close the circuit, in one direction of rotation or the other, of a small-150 watt motor. The shaft of this motor is keyed to the shaft of the rudder motor, which moves the rudder in the direction required to bring the ship back to her course. It is reported that the compass card is entirely uninjured by the current or spark, and that the device has been tested in squadron practice for two months with complete success.

A HANDY LITTLE DEVICE has been brought out for preventing the waste of current that often goes on in the electric lighting of hotels and large buildings. In hotel bedrooms, cellars and other places where persons are constantly passing in and out and requiring light for only short periods it not infrequently happens that the light is switched on and left burning, sometimes for many hours, to no purpose. The apparatus which makes such waste impossible is a small piece of clock work, by means of which an incandescent lamp is automatically switched off in half an hour, or any prearranged time. It can be included in any ordinary circuit instead of the switch, and at a very moderate cost.

BULBS of incandescent lamps are now blown with artistic designs in relief, thus obviating the use of a shade and increasing the beauty of the lamp.

Highest Bridge in the World.

The highest bridge of any kind in the world is said to be the Leo river viaduct on the Antofagasta Railway, in Bolivia, South America. The place where this highest railway structure has been erected is over the Melo rapids, in the Upper Andes, and is between the two sides of a canyon which is situated 10,000 feet from the level of the Pacific. Counting from the surface of the stream to the level of the rails this celebrated bridge is exactly 636½ feet in height. The length of the principal span is eighty feet, and the distance between abutments (total length of bridge) is 802 feet. The largest column is 314 feet 2 inches long, and the batter of the pier what is known to bridge builders as "one in three." The guage of the road is two feet six inches, and trains cross the bridge at a speed of thirty miles an hour.

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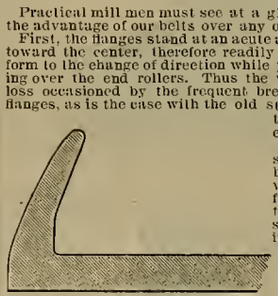

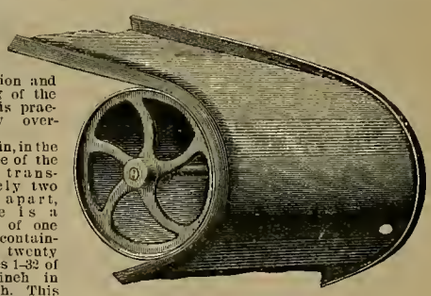

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Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty rifles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This rifle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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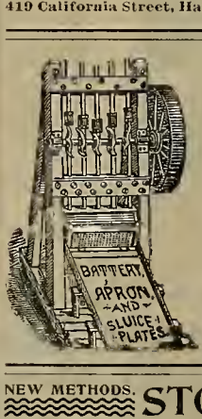

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Practical Information.

Sighting Big Guns.

Any one who has ever watched the target practice at any of the military points has no doubt been surprised at the way the guns are pointed, so that a shell, although it misses its mark, will drop into the water on the same line with the target.

"How do they get the range so well?" the unsophisticated will ask.

"By a range finder," some soldier or sailor will reply, and then he walks off," leaving the spectator wondering where the range finder is and what it may be.

The range finder is an instrument invented by Lieutenant Fiske, formerly attached to the United States ship San Francisco, and is one of the most complicated of the many pieces of mechanism on board a modern warship. The mass of mechanism is in a box which is about two feet square, and on the top of it are two small but very powerful telescopes at a distance of about a foot and a half apart. These two glasses work on a pivot, and also have an oscillating hinge so that they may be turned in any direction. Both glasses are directed upon one point, and the pivot in turning works upon a cogwheel below. This cogwheel, when turned, starts the machinery to work, and in much less time than it takes to tell about it the machinery indicates how far the target is from the water line of the ship.

The principle is that, as the distance between the two glasses is known and their angle is shown on a dial at the top of the box, the good mathematician can figure out almost instantly how far the center of the triangle is from the ship's side. With Lieutenant Fiske's range finder, however, the mathematician is not needed, for the machine figures out the distance itself, and when the telescopes have been adjusted and the machinery started it is but a moment before the bell rings and the distance is shown on an indicator at the breech of the gun. The range finder is worked by electricity.

It is but one of the many great improvements that have been made in gunnery during the last three years, and it is one of the most valuable. In the old days, when target practice was held, an officer used to stand on the ship's rail with a contrivance which looked like a T-shaped ladder. The rungs of this miniature ladder marked the degrees, and the officer, by holding this instrument and a strong pair of binoculars to his eyes could see how many degrees high or low, or to the right or left of a target, that a shell struck. But this was a great deal of work, and it was not altogether accurate, either. The range finder, though, is positively correct.

Many men have tried to prove that the range finder was not correct in its figures, but a range finder in good working order will solve any problem in its own particular line that may be put to it. A range finder is very rarely used when the distance is under 1000 yards, for any good gunner can guess at the proper sighting for a short distauce.

The American invention is the only good range finder in existence, and the navies of the other nations are speedily adopting it. They have already taken the American torpedoes, breech plugs and other improvemeuts.

Cost of Railroad Cars.

An ordinary flatcar costs to build about $380; a flat bottom coal car costs $475; a gondola drop bottom coal car, $525; a double bottom hopper coke car, $400; a box car, $600; a stock car, $550; a ventilated fruit car, $700; a refrigerator car, $800; a four-wheeled caboose, $550, and an eight-wheeled caboose, $700; a fifty-foot mail and baggage car, $3500; a second-class passenger coach, $4800; a first-class coach, $5500, and a first-class Pullman car costs $15,000.

THE *Engineer's List* says: "A good preparation for preventing tools from rusting is made by the slow melting together of six or eight parts of lard to one of rosin, stirring till cool. This remains semi-fluid, ready to use, the rosin preventing rancidity and supplying an air-tight film. Rubbed on a bright surface ever so thinly it protects and preserves the polish effectually, and it can be wiped off clean if desired, or it may be thinned with coal oil or benzine."

THE meter is 39.375+ inches, the decimeter 3.9375, the centimeter .39375 and the millimeter .039375 of an inch. A fair approximation can be had by calling the millimeter .04 or $\frac{1}{25}$ of an inch and the centimeter .4 of an inch, and by having some number to use as a comparator we get a better idea of the actual sizes, for five millimeters mean very little to us unless we think that it is about $\frac{1}{5}$ of an inch.

AN ENGLISH PAPER contrasts the cost of a steamer of 3500 tons capacity built on the Clyde in December, 1889, with the cost at which such a boat may be purchased from the same builders at the present time. The former price was $157,500 against $107,500 at present. Machinery is the same in both cases—triple expansion, 22, 35 and 59 inches by 39 inches stroke.

A BELGIAN INVENTOR has devised an immense lamp such as has probably never been seen before. The lamp is composed of 3,000 pieces. It is 6 feet high, and measures 7.10 feet, in diameter. It is fed with lard oil, and the consumption is said to be very small, its light being so powerful that one may read by it at a distance of 600 feet.

No. 9

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29. Losses in Gold Amalgamation. Cyanide Process.
30. Knowles Pumps.
31. Blake Pumps.
32b. Bridgman's Patent Ore-Sample Bag Machines.
32b. A New System of Ore-Sampling.
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C-2, Shapes for Crushing Members. F-1, Copper Moulds. F-3, Davies Slag Escape. F-4, Pyritic Smelting. F-6, Copper Converters. M-1, Prospectors' Stamp Mill. M-2, Alaska Mexican Mill. M-3, Blanton Cams. M-8, Barry Scarle on Stamp Stems. M-9, Eureka Hill Combination Mill. M-10, How Cheap can Gold Ore be Worked? P-2, DeBeers' Engines. R-5, Riedler 15-Million Gallon Pump. R-7, Alaska Mexican Compressor. R-6, Horn Silver Compressor. R-9, Milwaukee M. Co. Compressor. SL-1, Jones Underfeed Stokers. SL-6, Menasha Test of Jones Stokers.

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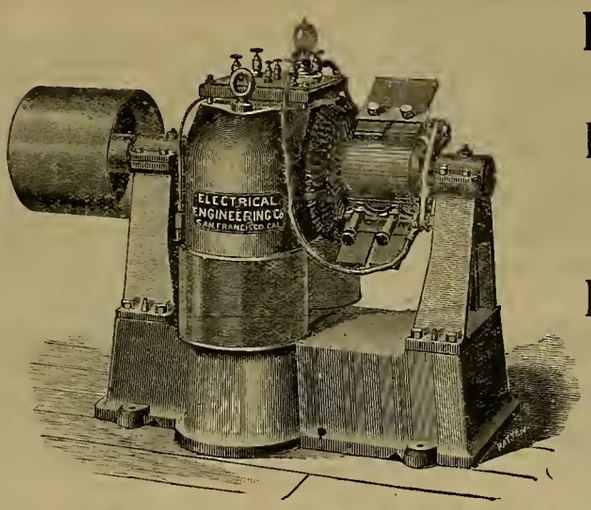

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Market Reports.

The Markets.

SAN FRANCISCO, Jan. 17, 1895.

Silver has been below 60 all the week. Extensive silver shipments are being made from New York and Omaha to Mexico for coinage at the Mexican mints.

Mexican dollars are quoted on the market at regular prices in advance of the value of the bullion contained in them. There is a small charge for mintage at the Mexican mint and a peculiar demand for them for trade with the far east. The owners of the bullion must have figured out the probable profit of the transaction and come to the conclusion that their silver will be worth more, adding all additional expenses, in the form of Mexican dollars than in the uncoined bars. The continuance of the practice must depend upon the profit to be gained, and this in turn upon the relative prices of silver bullion and Mexican dollars.

Omaha and Denver are also shipping refined silver bullion to China. In London the price of silver is dominated by the course of the American supplies. When these have all been pressed for sale the market has dropped away, for China and Japan have not been buying, and the very moderate Indian demand for the metal has been checked by the fall in the currency quotation since the cotton duties were formulated. In the New York Exchange, on the 10th, a sale of 10,000 silver certificates was made at 60. This is the first transaction in these certificates for twelve months.

Copper is quoted at 10c. Pig iron shows little improvement. Pittsburg reports a recent sale at $9 83. The actual cost to the manufacturer is set at $9.68. The Pennsylvania Railroad Co. is reported to have recently made a purchase of 30,000 tons steel rails at $22.

New Yurk Prices.

NEW YORK, Jan. 17.—Following are the closing prices for the week:

	Silver in—			
	London.	N. Y.	Copper.	Lead.
Friday	27⅜	59⅝	9 75	3 00
Saturday	27⅛	59⅜	9 90	3 05
Monday	27⅛	59⅝	....	.....
Tuesday	27⅜	59⅜	....	.....
Wednesday	27⅝	59⅝	9 75	3 10
Thursday	27⅛	59⅜	....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½c
New York Telegraphic Transfer	15c
London Bankers' 60 days	$4.88¾
London Merchants	$4.86
London Sight Bankers	$4.89¾
Refined Silver, per ounce	59¾
Mexican Dollars, nominal	50½@51

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	5 50
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	17	@	—
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 95
Bar	—	@	4 50
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 65	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	12 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Practical Treatise on Hydraulic Mining.

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This new and important book is on the use and construction of Ditches, Flumes, Dams, Pipes, Flow of Water on heavy grades, methods of mining shallow and deep placers. history and development of mines, records of gold washing, mechanical appliances, such as nozzles, hurdy-gurdys, rockers. undercurrents, etc.; also describes methods of blasting; tunnels and sluices; tailings and dump; duty of miners' inch, etc. A very practical work for gold miners and users of water. Price, $5, postpaid For sale by THE MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alta S M Co, Nev	48	10c	Nov 28, Jan 3, Jan 24	J E Jacobus, 309 Montgomery
Bulwer Con M Co, Cal	10	5c	Dec 11, Jan 16, Feb 15	J E Jacobus, 309 Montgomery
Confidence S M Co, Nev	25	30c	Jan 9, Feb 13, Mar 6	A S Groth, 414 California
Golden Eagle M Co, Nev	1	15c	Jan 8, Feb 23, Mar 4	E B Holmes, 309 Montgomery
Hale & Norcross, Nev	106	25c	Nov 23, Dec 29, Jan 23	A B Thompson, 309 Montgomery
Mexican G & S M Co, Nev	51	25c	Dec 5, Jan 8, Jan 29	C E Elliot, 309 Montgomery
Mono G M Co, Cal	34	15c	Nov 19, Dec 27, Jan 21	M E Willis, 309 Montgomery
Ophir S M Co, Nevada	84	25c	Dec 10, Jan 14, Feb 4	R B Holmes, 309 Montgomery
Potosi M Co, Nevada	43	25c	Dec 11, Jan 14, Feb 5	C E Elliot, 309 Montgomery
Reed M & M Co, Nev	1	2c	Dec 31, Feb 11, April 3	John H Isham, room 33, Mills Bldg.
Savage M Co, Nev	85	20c	Dec 4, Jan 7, Jan 28	E B Holmes, 309 Montgomery
Sierra Nevada S M Co, Nev	108	25c	Jan 16, Feb 20, Mar 11	E L Parker, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Belcher S M Co, Nev	C L Perkins, Mills Building	Jan 29

Mining Share Market.

SAN FRANCISCO, Jan. 17, 1895.

There was considerable manipulation during the week, stock being thrown upon the market with disastrous effect to several small operators. An effort to bear Con. Cal. & Va., and Ophir was only partially successful. An increase of gold in the bullion output of the former mine is reported.

The Mayflower Gravel Mining Company paid a dividend of 10c per share on the 15th.

At the annual meeting of the stockholders of the Sierra Nevada Mining Company 95,264 shares were represented and the following officers elected: Charles H. Fish, president; Charles H. Hirshfeld, vice-president; and A. K. P. Harmon, Thomas Cole and Herman Zadig, directors. E. L. Parker was re-elected secretary, and his financial statement showed a credit of $2443.71. An assessment of 25 cents per share was levied, delinquent February 16.

President Ives of the San Francisco Stock Exchange has appointed the following committees: Executive—James Marks, Charles Paxton, A. F. Coffin, M. A. McDonald and C. W. Fox. Finance—E. Epstein, O. R. Jones, James L. King. Stock List—A. J. McDonald, O. W. Marye, E. P. Barrett, R. F. Rodgers and S. Dixon. Commission and Rules—J. H. Crocker, A. G. Garnet and Werner Stauf.

The Debris Commission has granted permits to Goodman Brothers, Goodman & Bund and Hadley & Bolles to work their mines near Volcano, Amador county. Several other applications for permits were not acted upon.

Alta, and the 12th floor above the 1650 level in the Con. Va., share the greatest present attention as to the probability of immediate development.

The following illustrates the changes of the week:

MINES.	10	17
Alpha	$ 10	.....
Alta Consolidated	50	$ 33
Andes	37	34
Belcher	61	48
Best & Belcher	1 10	90
Bodie	80	80
Bullion	.....	11
Challenge	42	33
Chollar	46	42
Confidence	81	.....
Consolidated California and Virginia	3 95	3 50
Consolidated New York	.....	.....
Crown Point	69	60
Exchequer	.....	.....
Gould & Curry	44	34
Hale & Norcross	1 10	85
Justice	27	20
Mexican	1 10	89
Ophir	2 05	1 70
Overman	21	.....
Potosi	35	51
Savage	.....	47
Sierra Nevada	68	48
Union	66	54
Utah	06	06
Yellow Jacket	68	55

San Francisco Stock Board Sales.

SAN FRANCISCO, Jan. 17, 1895.

9:30 A. M. SESSION.

600 Alta	33	450 Justice	20
300 Andes	34	150 Mexican	87
350 Best & Belcher	89	300	88
50	90	900 Ophir	1 70
200 Bodie	80	100	1 65
800 Bullion	11	100 Overman	17
100 Chollar	41	500 Potosi	51
100	42	650 Savage	46
1000 Hale & Norcross	80	100	47
300 C. C. V	3 40	800 S. B. & M	11
850	3 45	100 Sierra Nevada	48
100 Crown Point	60	400 Union	54
300	50		

SECOND SESSION—2:30 P. M.

100 Belcher	48	330 Mexican	89
1300 Best & Belcher	90	100 Mono	25
500 Bulwer	10	200 Ophir	1 70
100 Challenge	33	200 Potosi	50
700 Chollar	42	200 Savage	47
1150 Crown Point	55	100 Seg Belcher	11
100	56	150 Sierra Nevada	48
460 Con Cal & Va	3 50	50	47
50 Gould & Curry	34	400 Utah	06
300 Hale & Norcross	85	300 Yellow Jacket	55
550	84		

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JAN. 8, 1895.

532,315.—CAR COUPLING—Downey & Hummer, Bishop, Cal.

532,334.—TROUSERS' STRETCHER—K S. O'Keeffe, S. F.

532,215.—LAMP HEATER—A. L. Robbins, Los Angeles, Cal.

532,116.—GRAVE IMPLEMENT—S. Todd, Alturas, Cal.

532,407.—NON-CONDUCTING COVERING—E. W. Tucker, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CARBURETOR.—Edmund R. Cook, Sacramento, Cal., assignor of one-half to Warren F. Drew and Moses M. Drew, Sacramento, Cal. No. 531,780. Dated Jan. 1, 1895. This carburetor is more properly a gas generator, and the invention consists, in connection with an air pump and an oil vessel, of a rotating screen reel composed generally of concentric cylindrical screens separated from each other, the outermost of the series being provided with cups or buckets for elevating the oil, which oil, by means of suitable directing plates between the screens, is guided and directed invariably to the center of the screen, and in its course meets with a flow of air which is admitted to the center of the screen and is forced outwardly against the incoming oil.

CARBURETOR.—Edmund R. Cook, Sacramento, Cal. Assignor of one-half to Warren F. Drew and Moses M. Drew, Sacramento, Cal. No. 531,779. Dated Jan. 1, 1895. This carburetor is especially intended for explosive engines and consists essentially of a mixing chamber communicating with the engine, an air inlet communicating with a mixing chamber, a sleeve in said air inlet forming a vaporizing chamber exposed to the inrushing air and communicating with the mixing chamber, a normally closed spring-controlled valve for feeding oil to the vaporizing chamber, and a means actuated by the inrushing air for operating said valve. The operation of the carburetor is wholly automatic and the mixture of air and gas is regulated to the needs of the engine both in volume and proportions. The inrush of air is effected by the sucking of the engine, and the volume and force of this air are wholly dependent upon the engine; therefore, when a large quantity of air is drawn in, it opens the valve to a greater extent, and thus feeds more oil, and, consequently, the amount of gas formed is commensurate with the volume of air. When less air is drawn in, the valve is not opened so far, and less oil is supplied, less gas is formed, and the mixture is still proportioned, and is proper for the requirements of the engine.

CAR COUPLING.—Wm. Chas. Downey and John Charles Hummer, Bishop, Cal., assignors of one-third to W. M. Richards, Keeler, Cal. No. 532,815. Dated Jan. 8, 1895. This car coupling relates to the old-style link and pin class, and is used in connection with means, controllable from the side or top of the car, for lifting and dropping the coupling pin, and for adjusting, leveling and guiding the link into the opposing drawhead chamber. The link-adjusting mechanism consists of a freely suspended slidable piece or plate having its forward end upturned, and its rear portion weighted, said piece or plate being mounted in suitable bearings, and having a bent or deep groove at its rear, whereby, when it is moved forward, its bent or grooved portion enables its weighted rear end to drop, and, thereby, elevate the front end, which, coming up under the link, levels and adjusts it, so that it enters the opposite drawhead with accuracy. Means are provided, operated from the side of the car, for actuating this adjuster plate, so that the link may be readily controlled. The means for lifting the pin consist of a rock-shaft on the car end, having a crank arm engaging adjustably the head of the pin, and said shaft is operated from the side of the car by means of suitable cranks.

Notice of Assessment.

REED MILL AND MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Ferguson Mining District, Helene, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 31st day of December, 1894, an assessment (No. 1) of two (2) cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 33, tenth floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 3d day of April, 1895, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

By order of the Board of Directors.

JOHN H. ISHAM, Secretary.

Office, Room 33, tenth floor, Mills Building, San Francisco, California.

Notice of Assessment.

GOULD & CURRY SILVER COMPANY—Location of principal place of business, San Francisco, Cal.; location of works, Virginia, Storey county, Nev.

Notice is hereby given that at a meeting of the Board of Directors, held on the 17th day of January, 1895, an assessment (No. 73) of fifteen cents (15c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 19th day of February, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the 12th day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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If platinum continues to advance in price, gold will soon be no longer distinguishable as the precious metal, as the continued rise will cause gold to be as cheap in comparison as silver is to gold. If an astute business man had foreseen this rise, and made a "corner" in platinum, he would have done a good stroke of business, for the price of platinum has increased five times during the past three years and is on the upward grade. The cause of this enormous appreciation is the demand for electrical purposes, and the output of the mines has not kept up with the demand. As electricity is brought home to the public the demand and price will increase, for there are several uses to which platinum is put for which no other metal has yet been found suitable. Notably among these are contact points and leading in wires for electric lamps. Electric bells even now are often fitted with contacts which resemble the real thing and yet are but a sham. In the other case the co-efficient of expansion is the valuable feature. Therefore the problem is to find a metal which will not oxidize on being exposed to the effects of the "break" spark of an inductive circuit and to get one which will make a tight joint with glass and has the same co-efficient of expansion as that material.

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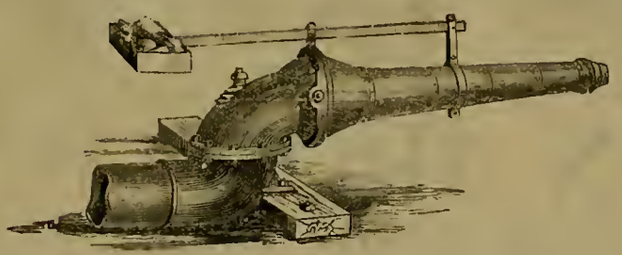

The above cut illustrates the IMPROVED FORM OF DOUBLE JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

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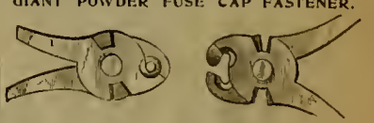
GIANT POWDER FUSE CAP FASTENER.



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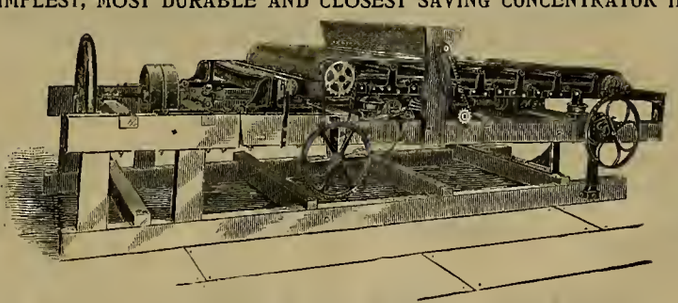

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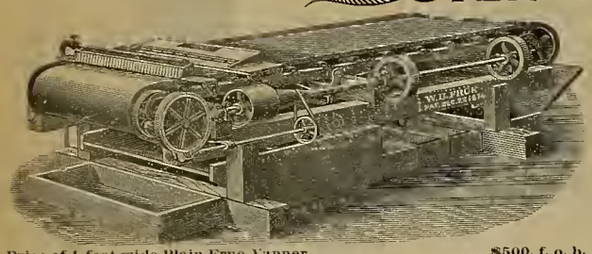

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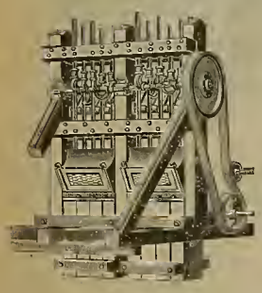

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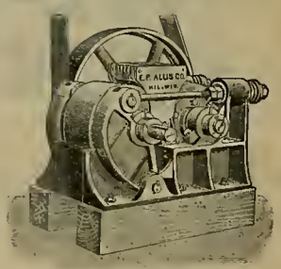

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VOLUME LXX. Number 4.

SAN FRANCISCO, SATURDAY, JANUARY 26, 1895.

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Marking Mining Locations.

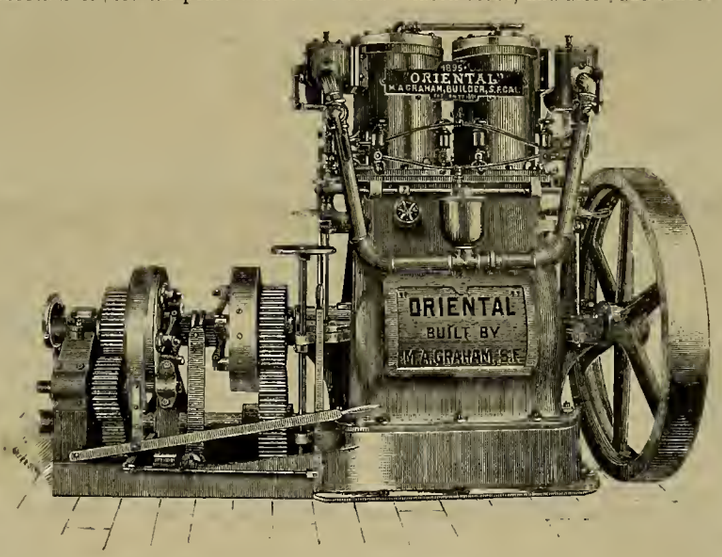
Careless marking of the boundaries of a mining claim at the time of locating may make trouble for the owners, especially should the mine become rich and well known. Then, when it is worth having, plenty of people will be willing to establish claim to it if they can. The locator should, of course, first try to find the vein, and, that being found, should determine its general direction, by which direction he will be governed in marking the boundaries of the claim on the surface. Then, when he records his claim, he should give the course and distance, as nearly as practicable, from the discovery shaft of the claim to some permanent, well-known objects, such, for instance, as stone monuments, blazed trees, the confluence of streams, points of intersection of well-known gulches, ravines or roads, prominent buttes, hills, etc., which may be in the immediate vicinity, and which will serve to perpetuate and fix the position of the claim and render it susceptible of identification from the description given in the record of locations of the district. In addition to this, the claimant should state the names of adjoining claims, or, if there are no adjoining claims, the relative positions of the nearest claims. He should drive a post or erect a monument at each corner of his surface ground, and at the point of discovery or discovery shaft should fix a post, stake or board upon which should be designated the name of the lode, name or names of locators, number of feet claimed, and in which direction from the point of discovery.

It is essential that the location notice filed for record shall, in addition to the foregoing description, state whether the entire claim of 1500 feet is taken on one side of the point of discovery, or whether it is partly on one side and partly on the other side; and in the latter case how many feet are claimed upon each side of the discovery point. It is important that great care be taken in making, describing and marking mining claims in the notice of location for record. An application for a mining claim survey may be declined by the mineral deputy surveyor where the location is not properly marked on the ground and recorded; and when he makes such survey he must give in his field notes the bearings and distances of his corners to those cited in the location notice, and the same must be shown on the official plat of the survey to enable the department to determine the legal propriety of the survey. The provisions of the law must be strictly complied with in each case to entitle the claimant to a survey and a patent. In all cases, if the location was properly made, it was marked upon the ground. If the survey of it was properly executed, it must have been within the limits thus marked, and if the marks of the location and those of the survey are identical the facts must appear stated in the official field notes.

THE Idaho Legislature has adopted a memorial to Congress asking for the immediate passage of the Hartman mineral land bill, now pending before Congress, to the end that the rights of miners and prospectors may be protected within the limits of the Northern Pacific Railroad land grant.

The Oriental Gas Engine.

Among the local industries there is none acquiring more prominence than that of the manufacture of gas and gasoline engines. The cut herewith illustrates a 40 H. P. "Oriental" marine gasoline engine, built by M. A. Graham, 105 Beale street, this city, for a mining syndicate of Lower California for transportation of bullion and supplies. The simplicity of design, and consequent ease with which it can be managed, its reliable action under all conditions, has given the "Oriental" a most enviable reputation among users of gas engines, in consequence of which the works have been for several months principally engaged upon engines for marine purposes. They are now engaged upon a 20 H. P. marine engine for the pearl fisheries of the southern coast, and also a launch engine for New York City. So it would seem the reputation the "Oriental" has obtained at home is reaching more distant shores, and it is only another evidence of the excellency of many of the products of the Pacific coast.



THE ORIENTAL GAS ENGINE.

CONSIDERABLE notice has been given in these columns to the recent co-operative experiment at the Morning mine in the Cœur d'Alene district, which closed down because, virtually, the owners considered themselves unable to pay the men the $3.50 per day required by the Union. The plant was a finely equipped one, the ore a silver-lead concentrating. Figures furnished state the cost per ton of crude ore was as follows: Mining, $1.536; milling, .276; railroad (mine to mill), .108; general expense, .04; sampling, .08; royalty (19%), .475; total, $2.576. This paid the miners $2.625 per day, omitting anything for the use of the plant or tools. The matter illustrates the necessity for the closest management to keep any sort of such proposition going at the present prices of silver and lead.

UTAH ore producers are not renewing their annual contracts with the smelters. The latter appear to have combined on advanced rates, and the producers say they will make no contracts till the fate of silver is more definite than at present. Several of the ore producers talk of building an independent smelter, to be run solely in their interests.

Montana Mine Inspection.

The Montana State Mine Inspector in his sixth annual report gives a general description of the principal mines of the State, with a description of the size and style of engines, cables, etc., and makes many practical suggestions. He favors abolishing the use of crossheads at a depth not lower than 100 feet below the surface, holds that mine owners and managers should permit official inspection in every department of surface and underground work, reminding them that the inspector of mines is sworn not to reveal the secrets of underground workings and deposits, the magnitude of bodies, class of ore and value, or aught else which, if made public, might affect the business interests of owners or leasers, and states that he is accredited with more power than he is granted by law. He cannot stop work in a mine, nor can he even enter a mine without permission of those in charge, any more than a private citizen.

He points out the necessity of greater protection for those who daily enter the mine by cages, suggesting the use of a permanent network of wire not less than three and one-half feet in height on either end, and wire network doors the full width of the cage for either side. These doors could be opened outward and closed again as easily as the bar can be lifted and put down, provided the floor of the cage does not stop below the level of stations.

He urges the formulation of a State code of mining signals, about the same in substance as the Voorhees law passed by our State Legislature in March, '93, saying, "A major portion of the fatal mine accidents which have occurred in Montana during the past fifteen years are attributable solely to the misunderstanding of signals, the forgetfulness of engineers or from ignorance of the code of signals in use when a new engineer takes charge.

"With a universal code of signals it is plain to be seen that hundreds of accidents would be avoided.

"Every engineer and miner would have but one code to learn. This code would be so firmly impressed upon the mind that forgetfulness would be almost impossible. Like the alphabet, these signals would go on from youth to old age, never to be eradicated from the memory when once learned.

"At present there are at least fifty different codes of signals in use, and, when changing from one mine to another, engineers, and even foremen and managers, must learn a new code. This is liable to result in a confusion of ideas, especially where quick work is required."

The report is replete with points for the convenience, safety and welfare of all concerned, and deserves affirmative action.

THE third Government survey of the bay of San Francisco, which will shortly be begun, will, among other things, determine the effect upon the bay of any detritus alleged to have been washed down from the hydraulic mines. It has long been claimed that the depth of the upper part of the bay has not been diminished thereby, as the quantity must necessarily have been very small.

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J. F. HALLORAN.....General Manager

San Francisco, January 26, 1895.

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Progress of the Work.

During the week Congressmau Caminetti introduced a resolution that all pending selections in railroad graut interests now awaiting pateuts shall be suspended until Congress takes action providing for the classification of mineral lands in all land grants.

Hartmau, of Moutana, asked unauimous consent for the cousideration of a resolution for the Secretary of the Interior to suspend all action lookiug to the approval of selections aud pateuting to railroads of any lands selected under the rules issued July 9, 1894, until Congress may dispose of the bill now pending in the Seuate and finally settle the question of the classification of granted lauds. Mr. Hartman showed that 1,092,000 acres of land were iuvolved.

Tracey, of New York, objected.

The Committee on the Protection of Mineral Lands, in this city, which has been untiring in its work since its appointment at the State Miuers' Association sixty days ago, has met with an unexpected check in the General Land Office at Washingtou. Uuder the assumption that it was a public institutiou and that the miners of this State have the same rights as other citizens, the committee sent an ageut to Washington, D. C., to examine the records of the General Land Office and find out the exact locatiou of the lands to which the railroad company lays claim, and such other information as can only be there ascertained. H. F. Clark, the agent so sent, reports that he has been refused the right to copy those lists. It is unfair to assume that Mr. Clark is *persona non grata*, so the ouly just conclusion is that some unwarranted influence has succeeded iu closing the doors of this public institution to the Califoruia miners, and the interests of the public are subverted. Protests against the patenting to the S. P. Co. of 65,600 acres in the Visalia district and 14,264 acres iu the Iudependence district have been sent to those districts. These or similar protests would have been ineffectual after next Monday. They are based on the avowal that the lands are more valuable for mineral than agricultural purposes.

The work of the committee is of interest to every one directly or iudirectly counected with the mining industry of the State. The result of the corporation's efforts to secure control of those vast areas of lands would greatly diminish the available amouut of mineral land, and the committee's efforts are in parallel lines with the best public policy and the general good. Upou the active co-operation and substantial help of those most interested in saving the public lands from such absorption depends, greatly, the measure of success that shall attend the committee's efforts.

The U. S. Geologic Survey.

The proper scope of work of the U. S. Geologic Survey has always been a subject of discussion. Just now an effort is being made to check the work of the Survey in certain practical lines, and limit its usefulness, by assailing the motives of those in charge. Motives can always be misconstrued or misjudged, and discussion thereon savors too much of the personal to be admissible in a technical journal. Among other things asserted by the opponents of the Survey's system is that "the work of the Survey should be purely scientific." It is ueither the province nor the purpose of this jourual to fly to the defeuse of the Survey or its Director, but as a well-wisher to all parties in the controversy it is to be said that the quoted statemeut shows a lamentable lack of understanding of public requirements. There is too much of this hidebound, dry-as-dust demand for "pure science," which is largely abstract, theoretical, dilettaute research and observation. The Director of the Survey is attacked mainly because he wauts to do somethiug practical for the miners in the west half of the uatiou, and the opposition thereto is mostly sectional. Director Wolcott recognizes the practical needs of the mining interests of the country, and in this regard, at least, deserves to be upheld.

Every one conversant with the efforts made to have the importance of our mining interests recognized knows how strenuously this paper labored to secure the establishment of a bureau of mines and mining, similar in scope to the recently created Department of Agriculture. The Congressional Committee on Mines and Mining, to which a bill was referred, rejected the proposition, saying that the United States Geological Survey is to all intents and purposes practically a bureau of mines and miuing. Now that recognition is proposed of this fact a cry is raised that Director Wolcott has been "captured by the Western boomers." Uufortunately, sundry journalistic parrots repeat this cry, when duty to the interests they represent and better understauding of the question would impel them to aid instead of retarding au effort to give the mineral interests of California, Nevada, Colorado, Montana, Idaho, Oregon and the Territories attcution commensurate with their importance on the part of the United States Geological Survey.

The assertiou that "the work of the survey should be purely scientific" is illustrative of a belief in some quarters that general geology is the sole scope aud constitutes the just limits of the work of the Survey. Any thing published or worked up by the Survey telliug the miner anythiug of practical value to him is considered outside of aud foreign to the intent of this branch of Government service. But that is the very thing that the Survey is for. General geology, "pure science," is all very well for a pure scientist, but it won't tell a miner anything about how to make his rock pay. It won't tell him of the new processes and methods of miuing. The miner doesn't want a finely published treatise on "The tangible effects of a chimera revolviug in a vacuum." He doesn't care much about a catalogue of rare minerals in a glass case. He is uot specially interested in a monograph on the Megatheriums of the Miocene period, but he does waut some applied science; he would like to get from this Government institution, supported by public taxation, a few practical points on mining and metallurgy; he would like to be given in plain shape the up-to-date condition of miniug processes of value to people now on earth.

Great objection is made to the work of the Survey in giving attention to practical miuiug and metallurgy. But the economic value of these things justifies such attention. The Agricultural Department makes experimeuts, produces seeds, sends them, conducts correspondence, and makes itself useful in the concrete rather than in the abstract, and thus fulfills the purpose for which it was created. The United States Geological Survey need try no such experiments, nor seud samples, but it is within its province to report and record results aud increase the geueral fund of practical information. If a man is working a particular ore in a peculiar way, it is for the Survey officials to so report. As between scientific miners aud practical miners, the latter have the best of it in results and are entitled to recognition in the work done by Government institutions. The utility of the Survey will be better recognized by the miniug community if the ideas of the Director iu this regard arc not hampered by those who stultify themselves in unworthy opposition to intelligent effort for the general good.

Economy—Wise and Unwise.

Retreuchment and reform are the present watchwords and the avowed policy of the Governor and Legislature. Both are necessary, and now is a good time to put them in practice. The State is in bad financial condition aud the taxes are onerous. The appropriation in '91 for the support of the State Government for the two fiscal years beginning with the 1st of July of that year, amounted to $9,748,696; the corresponding appropriations iu '93 were $11,-972,623. These figures are furnished us by the State Controller. What the appropriations for '95 will be is for the present Legislature to determiue. The sum of $6,000,000 a year is too much to annually tax a commonwealth of 1,250,000 people. Aud that $6,000,000 is only half the load. There is another $6,000,000 annually required for county governments. Our present State officers are pledged to economy. They have a splendid field for actiou. We are paying too much for what we get, and are payiug for a good deal that we do not get at all. California pays, every year, for the support of insaue asylums, $800,-000; for State prisons and reformatories, $550,000; for deaf, dumb and blind, $100,000; for feeble minded children, $110,000. Here is an annual tax of $1,560,-000 to support a non-producing and unfortunate class. The State priuting office costs $125,000 a year, the State militia are given $175,000 annually; that annual horse trot known as "the State Fair" has its thousands; every year $27,500 is given the State library; the institution known as "the State Board of Horticulture" gets $15,000 every twelve months; the gentlemeu who have charge of hatching fish have au anuual fund of $18,500; the other gentlemen who look after "Yosemite and the Big Trees" have $14,000. There is also paid out every year for Railroad Commissiouers, $17,870; for State Board of Equalization, $15,250; for Registrar of Voters, $6,-000; for Goveruor's office, $18,900; for Secretary of State's office, $24,000; for State Controller's office, $15,480; for State Treasurer's office, $12,400; for Attorney-General's office, $24,080; for Superintendent of Public Iustruction's office, $8,600; for Surveyor-General's office, $12,280; for employes of Capitol Commissiouers, $18,600; for State Harbor Commissioners, $27,600; for State Board of Health, $5,000; for San Francisco Board of Health, $5,000; for Bank Commissioners aud their employes, $18,800; for Insurance Commissioner's office, $4,800; for State Normal School, $97,000; for Guardian of Marshall's Monument, $600; for office of State Examining Board, $6,400; for Adjutant-Gencral's office, $6,600; for Park Commissioners' office, $6,300; for Commissioner of Public Works, $5,800.

Then there is the Viticultural Board, $15,000 a year; the Labor Bureau, $7,500 a year; the Loan Association Commission, $24,000 a year, and so ou. The records of the State Board of Examiners also show that commissions and boards that perform duties without pay have considerable iucidental expenses.

The above is not oue-half, but it gives a good idea of where the millions go.

Any intelligeut person can see at a glance how inflated all this is. Probably forty per ceut of the abovc is extravagance and waste. It would be wise ecouomy to cut deep and lop off some of those finaucial excresceuces.

But there is true and false ecouomy, wise and uuwise effort at retrenchment. Economy is only the judicious expenditure of money. Results must also be considered. There is one appropriation for a State institution that does more for the good of the State than any other. It is the annual appropriation for the State Mining Bureau. Singularly enough, that is the very one first singled out for legislative action that virtually abolishes it. Mr. Langford, of San Joaquin, has already introduced a bill which, if successful, will deal a blow to the mining industries of the State that will seriously hurt the commonwealth.

It is neither our province nor our purpose to im-

pugn the motives of any legislator, whether from the valleys or the mountains. It is to be presumed that a member of the California State Legislature goes to the Capitol to work for the best interests of the State. Hence, the most charitable view of Mr. Langford's action is to assume that he is incorrectly informed as to the value of the Bureau whose usefulness he seeks to impair, and that he is not acting in defiance, but in ignorance of the valuable interests to which he is antagonistic. This attempt to destroy the usefulness of the State Mining Bureau is an instance of unwise economy. The very last thing that should be assailed by reason of its splendid record of practical usefulness is the first. It looks more like reprisal than economy: more like hostility to the miner than honesty in redemption of ante-election pledges. It is unfair, unwise and uncalled for, and the PRESS gives editorial prominence to this matter, with the intent of calling upon every one in the State directly or indirectly interested in California's great mining industry to voice their protest against such proposed action.

The State Mining Bureau is now at the front as a factor in promoting the State's mining interests; it has given grand aid in directing attention to our mineral wealth; it is the only institution the miners have; the few thousands it annually costs represent not a one-hundredth part of the actual resultant benefit; it is now in the zenith of its usefulness, and he may justly be looked upon as an enemy of the State who would seek to cripple it.

These are strong words; but the facts justify them. With every other industry paralyzed; with a scarcity of money, a dearth of employment and a lowering of wages, the one institution representative of an industry that yearly puts out $20,000,000 in tangible wealth is considered worthy of being relegated to a comatose condition. That is not economy; it is destructive and injurious; it borders on the idiotic. Any one can destroy: it takes work, effort, ability, intelligence, to build up and create, but an idiot with a torch can burn down the grandest earthly creation. It has taken a great deal of hard work to make the Mining Bureau the present potent factor in the State's mineral wealth; every dollar it receives is faithfully and intelligently spent and rigidly accounted for; its results redound to the State's benefits a thousand-fold, and there are many reasons why it should be encouraged and maintained instead of being threatened with dissolution, to elaborate on any one of them being unnecessary to those who can understand it and useless to those who cannot.

If the Legislature is sincere in its intents of economy, it poorly shows it. Already it has beyond all preceding years displayed shameless extravagance. It has this week created a swarm of unnecessary employes in the State capital for the session who daily draw $1524. Over $1500 a day worse than wasted! Yet a few dollars is grudged an institution like the State Mining Bureau that is the means of yearly insuring the development of millions in the great domain of California's mineral wealth.

We call upon the miners and mining men of the State to aid in preventing this infamy—for infamy it is—being done. Nothing but lethargy and inaction will permit such injustice to the State as the proposed legislative action regarding the State Mining Bureau. Mining is the basis of all civilization, all material wealth, all progress. Bullion is the blood of business, the life of commerce, the essence of advancement. The rise or fall of legitimate mining marks the rise or fall of California. True economy, wise legislation, would increase the scope instead of attempting to destroy the only State public institution that benefits the miner and the State, for with the fortunes of the miner is indissolubly bound up the fortunes of the State. We call upon the press and public sentiment to resist this attack upon the prosperity of the State. As a cold business proposition, such interference as that in the Langford act is suicidal.

Obituary.

H. F. REINHART, a prominent mining engineer, residing at Chihuahua, Mexico, was killed a short time ago by the accidental discharge of a gun. He was a native of Mannheim, Germany, and in his 39th year. During his business career in Mexico he caused many million dollars worth of American mining machinery to be imported into that country. He was a resident of this city from '75 to '80.

Manufacturers' National Convention.

A convention of manufacturers has been in session this week at Cincinnati, O. The proposition is to form a National Association of Manufacturers, which shall embrace among its purposes:

1. The cementing of a national organization of the manufacturers of the United States, for the purpose of considering national questions affecting their interests.

2. The advocacy of carefully considered legislation to encourage manufacturing industries of all classes throughout the country.

3. The discussion of ways and means whereby trade relations between the United States and foreign countries may be developed and extended.

4. The establishment in South American capitals and other desirable points of expositions for the display of American products.

5. The extension of the commercial marine of the United States.

6. The recognition of the Nicaragua Canal and the control of the same by the United States Government.

7. The re-establishment of reciprocal trade relations with foreign countries.

8. Such other topics as may be agreed upon by the convention.

This convention is non-political, non-partisan and non-sectional.

The preliminary work was satisfactory, and much resultant good may justly be expected.

The arrangements for the convention were as elaborate as for a national political convention. The original fund of $10,000 was doubled. Over 1200 delegates wrote that they would be present. While it is proposed to open up commerce with the South American republics, yet all the interests of manufacturers were considered.

Concentrates.

THE Gordon mine, at Baker City, Or., has been sold to Boston men for $4000.

SENATOR WOLCOTT'S BILL to establish a coinage mint at Denver has been reported favorably.

THE Eagle Bird mine near Washington, Cal., has closed down, the deep snow having broken the flume.

THE *Times* says that there is scarcely a day that prospecting outfits do not pass through Yuma from California.

THE dry house at the Omaha mine, Grass Valley, was destroyed by fire last Monday night. The miners lost their clothing.

THE report of the Alaska-Treadwell mine on Douglas Island, Alaska, for December shows an average of $2.24 per ton for the ore milled.

THE Kansas City Consolidated Smelting Company has closed its Salt Lake office and moved its western headquarters to Butte, Mont.

THE November report of the Alaska-Mexican mine on Douglas Island, Alaska, shows that the ore averaged $2.29; the cost of working was $1.95 per ton.

THE Black Butte mine, near Canyon City, Or., has been sold to Hall & Smith of Portland; they announce their intention to erect an extensive reduction plant.

THE new spur wheel for the Providence hoisting works has arrived at the mine at Nevada City. The miners have gone to work again, after being idle three weeks.

THE Siskiyou Gold Mining Co. has incorporated in Tacoma, Wash.; incorporators, W. H. Reid, J. L. McMurray and S. C. Slaughter; capital stock $100,000, divided into 10,000 shares of $10 each.

NEARLY every mine in Grass Valley was shut down a part of this week by reason of a break in the South Yuba ditch. Deep snow has occasioned much damage to flume and ditch property.

RESUMPTION of work in the White Horse mines seems to be the order of the day, says the Virginia *Enterprise*. It is probable that the Washoe, Defiance, Jim Blaine and Black Warrior will begin prospect work in the near future.

THE Austin *Reveille* says the Imperial Mining Company of Kennedy, Nev., has not paid its men, and that the liens filed on the property are not valid. There is abundance of ore in Kennedy, but it cannot be successfully worked in the Imperial mill.

THE Gold Eagle, Golden Mound and Ocean Wave gold claims in Ellsworth district, Yuma Co., Arizona, have been sold to Lewalling and Kimball for $9000. There is good water within half a mile of the camp. The ore is free milling and runs as high as $80.

THE Orleans Mining Co., at Nevada City, is adopting the co-operative plan. The owners have increased the capital stock to 60,000 shares, and are selling 12,500 shares at one dollar each. The miners employed take $2 per day in cash and $1 per day in stock.

THE Elkton Mining & Milling Company has given a title bond on its property at Cripple Creek, Col., the Kentucky, Bell and Elkton mines, to J. M. Parker, D. Fletcher, A. Buckler and others for $500,000. This is one of the most important sales in the history of Cripple Creek.

THE Union Leasing and Mining Company of Leadville, Col., has taken a lease for a term of five years on the plant of the American Smelting Company in that city. This plant has been idle since the collapse of silver in 1893, but will be put in prime operating condition with the addition of a number of roasting furnaces.

THE Montezuma Mining and Reduction Co. are shipping copper from Fairbank, Arizona, from their property at Nacosari, 140 miles from Fairbank. The ore averages 15 per cent, concentrated to a 50 per cent proposition, and smelted under a process that turns out a ton of matte from a consumption of two tons of coke.

GREAT interest prevails at Silver Cliff, Col., over a new gold strike four miles from there. The rock formation and ore are said by Cripple Creek experts to be identical with those of Bull Hill and Has Been, made by the best assayers in the State to show from $12 to $700 per ton gold and silver values. The vein is on the Bassick mine belt.

J. A. ELLIOTT, of Butte, Montana, has invented a gold machine for which great claims are made. The inventor says that ground running fifteen cents to the yard can be made to pay by working it on a large scale and with favorable surrouudings. Big money can be made with ground running from twenty-five cents to $1 per yard.

ANOTHER big gold strike is reported in the New York and Chance mine at Creede, Col. Heretofore the mine has been a rich silver producer, and has earned several hundred thousand dollars for the owners. The strike was made on the 1000-foot level. A shipment made carried fourteen ounces of gold and 400 ounces of silver. Henry Wolcott and Judge O. E. Le Fevre, of Denver, are the principal owners.

AN EASTERN SYNDICATE has secured control of the old copper mine located near the headwaters of Clover creek, Union county, Or. It is said that a large number of workmen will be employed this winter in development work. The mine is one that was discovered several years ago, and, although rich in copper, it has never been extensively operated. It is about six miles from North Powder, where supplies are purchased.

A YOUNG MAN named Jas. Ryan was killed at the Coffee Mill mine, near Mokelumne Hill, last Sunday. He and his partner were working in a single drift. The timbers indicated heavy pressure and Ryan sent his partner for a lagging to strengthen the timbers. His partner had gone but a short distance when he heard a crash. Rushing back he found Ryan under a mass of earth. His head was not covered, but a lagging lay across his throat. It took two hours to remove the earth and extricate the body.

INQUIRY is progressing regarding the recent awful explosion at Butte, Montana. A former employe of the Kenyon-Cornell Company says there was usually kept on hand anywhere from five to forty boxes of giaut powder, each holding fifty pounds. The room in which the powder was kept was surrounded by several thousand wrought-iron "rabble heads," pieces of iron ½x4x6 inches, used for heads of skimming tools in smelters. They had been piled around the powder to protect it from a bullet, should any be fired against the building, and were considered to afford full protection.

THE De La Grange Hydraulic Mining Co., incorporated at $5,000,000 under the laws of Colorado, has twelve miles of ditch for its placer property in Trinity Co. The Junction City Mining Co. is capitalized at $400,000 to work in the same county. The Minersville Mining Co. is a close corporation owned by Messrs. Beaudry, Duvergey, Chartier, Cumenge, and Count Kergoldy. The latter company has in operation six miles of ditch, carrying 4000 inches of water, with a 300-foot pressure, and is running two giant nozzles, each ten inches in diameter.

A SHAFT is being sunk in the heart of the town of Oroville, Cal. The plan is to sink to bedrock a depth of fifty feet and thence drift out the gravel. Past prospecting has shown that one of the richest beds of gravel in the State is in the bar of Feather river upon which the town of Oroville is built. The great difficulty in the past has been to cope with the water. The present projectors believe they have machinery that will drain the ground. Drifting out the gravel at that depth will not disturb the surface, and mining may be successfully prosecuted under the entire town if the water can be handled.

A CASE involving 160 acres of land in Calaveras county has been on trial this week in the Land Office, being a contest as to whether it was mineral or agricultural land. The decision was in favor of the miner. The case is of considerable local importance to the inhabitants of the West Point mining district. The land adjoins the town of West Point, and has been used since the 50's for mining purposes by various parties. Extensive mining operations have in the past been carried on thereon. On one claim, the Zacerateo, some $125,000 has been expended. The land is seamed in many places by quartz veins.

J. E. FRICK, one of the stockholders of the White Swan Mining Company, an Oregon corporation, has begun suit in the superior court in Chicago on behalf of himself and other stockholders against F. W. Ferry and A. S. Wright of Ferry & Wright. The plaintiff alleges that the defendants entered into an agreement to purchase the White Swan gold mine at Baker City, Or., for $90,000, and were given possession and started to work it, but in a short time abandoned the property, and refused to pay for it. The plaintiff now seeks to collect the amount which the alleged purchasers agreed to pay, with damages. The defendants are dealers in mining property, who have had their headquarters in Chicago.

Personal.

LOUIS ROBINSON, who had charge of the Machinery Department at the World's Fair, has gone to Montevideo as fleet engineer of the South Atlantic squadron.

U. S. GEOLOGICAL ENGINEER M. BISHOP is at Bisbee, Arizona, to review the new boundary line between Mexico and the United States. Lieut. Bishop's party has been in the field for the past eight months, and has lately been transferred to the S. E. Div. of the Geological and Topographical Survey for the War Department.

LIEUTENANT MEIGS, of the Bethlehem Iron Company, who negotiated the contract which the Russian Government recently awarded to the company, has returned from St. Petersburg, bearing all the papers for the order. The contract is for 1500 tons of unharveyized armor plate, 1200 tons of which is sixteen-inch plate and 300 tons seven-inch plate. The value of the contract is $1,250,000. The contract will keep the plant busy a year.

Mining in California.

A Review of the Situation Shows the Industry to Be in a Most Prosperous Condition.

At no time within the past fifteen years has the mining outlook in California been so promising as now. During the past two years there has been a marked improvement in the situation. Numerous new enterprises have been organized and placed on a substantial basis, and are now paying. Fully as many mines, long abandoned, have been, or are now being, reopened under more favorable auspices than obtained at the time when operations were discontinued.

In this State there are twenty-three counties where mining is an important industry, and among these there are several in which it constitutes the chief or only one. Besides these there are eighteen other counties in which mining or quarrying give employment to a large number of men.

The continued successes of some companies, numerous rich strikes in old mines and the discovery of gold rock in places where it was heretofore unknown, and the repeated successes of newly organized companies have all had a direct and beneficial effect in directing the attention of capital to this State of of phenomenal resources. Not only have resident capitalists made large investments, but moneyed men have come from many Eastern cities and from Europe seeking secure and profitable investment. Thus far, most fortunately, we have only successes to chronicle. "Wild cats" have not yet put in an appearance, though these, the most detrimental of all things to legitimate mining, are likely to appear at any time. The men investing are showing a disposition to engage in mining on a strictly legitimate basis, which, indeed, is the only basis on which mining enterprises can hope to exist in these days.

There is no denying the fact that the unprecedented depreciation of silver has in a large measure added to our prosperity. Large capital interested in silver properties was actually "forced out of business." Naturally this capital would seek a new channel for investment. A look over the country quickly showed that the broadest, most legitimate field lay in California. Her mines had already produced $1,200,000,000 in gold, and there was every indication that hundreds of millions more were obtainable if a combination of capital, labor and experience were directed this way.

This increase of prosperity has not come upon us suddenly. For two years or more past there has been an increasingly greater interest taken in our mines, until within the past six months it has assumed the proportions of a "rush for gold." It is to be most sincerely hoped that the legitimate will be strictly adhered to, as one disastrous, ill-advised investment will do more to retard new enterprise than a dozen successes can overcome.

Some of our most famous mines, notably about Nevada county and in Amador, have been worked continuously and successfully for years. Still, there always remained that doubt, "Do these mines go down?" The experience of the past and that of today has demonstrated in a practical and convincing manner that these great leads "do go down," and, moreover, that the greatest depth yet attained on any vein, which is almost half a mile, shows no falling off in the value of the quartz at this great depth. There are shafts in Mariposa county 1500 feet deep, in Calaveras equally deep, and in Amador there are several shafts down more than 2000 feet, and one 2400 (the old Eureka) at Sutter Creek. There are a score or more of shafts over 1000 feet in depth in California, and some of the deepest are being sunk still deeper with the most encouraging results.

Prominent among the long-abandoned mines now being reopened, and it may be said in each case with most encouraging results, are the Rosalia in Riverside county, where a vein worked years ago by Mexicans to water line has been reopened and the workings are in a fine vein of quartz that will pay.

In Mariposa county the great mines of the Cook estate near Coulterville have passed into other hands and will be thoroughly rehabilitated. These mines have lain idle for years. It has also been stated that the mines of the Mariposa estate are to be reopened and equipped once more.

In Tuolumne county a dozen old mines long abandoned are once more the scene of activity, and nothing but prosperity is anticipated from them. Prominent among these is the Mammoth at Jacksonville, which recently passed into the hands of the Sierra Buttes Company. This company has also purchased the Whitlock mine, five miles north of the town of Mariposa, and are outfitting it with a fine plant of machinery. This is one of the most promising properties in that county.

In Calaveras county the Gwyn mine near Mokelumne Hill, abandoned in 1882 at a depth of 1500 feet, is being reopened. The Boston mine is also being worked once more. The Calaveras Consolidated on Carson Hill has put in two busy years opening that property. Besides these, there are several smaller properties where activity has succeeded lethargy or abandonment. Among these are several drift mines and hydraulic enterprises.

Amador county is a prominent field of operation among old mines. The leading mines are the New London and Pioneer at Plymouth, and it is said the Alpine mine in the town of Plymouth is also to be reopened. At Sutter Creek the Mahoney mine is again in operation, and south of Jackson the Hardenburgh is again in bonanza.

Farther northward, in Butte county, the famous Magalia drift mine has been purchased by J. B. Haggin, and promises, if reports be true, to prove a large producer. Many other instances might be cited, as this revival is extending all over the State and is reaching beyond our borders.

There are, too, numerous new enterprises where capital has been interested in the development and equipment of promising prospects. In San Diego county the Gold Rock mines were purchased by an Eastern corporation, known as the Golden Cross Mining Company. The mines are six miles from Ogilby station, on the Colorado desert, and fourteen miles from the Colorado river, from which water is pumped to the mine, being forced to an altitude of nearly 500 feet. A forty-stamp mill crushes 100 tons of rock daily. The ore shoots are very large. This concern demonstrates the possibilities on the desert.

In the Julian district, also in this county, all is activity after fifteen years of stagnation. Twenty or more mines are in operation, mostly by leasers, who have the rock crushed in custom mills. Pine Valley and Mesa Grande districts are also active.

In Riverside county the Good Hope has passed into the hands of Eastern people and has been completely equipped. The Lost Horse and Pinyon Mountain mines, on the Colorado desert, have produced several thousand dollars in the past year.

In the San Bernardino mountains several new companies are at work, and it is said Baldwin's Gold Mountain mine is to be equipped once more. This mine was abandoned years ago, and the camp—Blairstown—was completely deserted. Tools were left lying promiscuously about, doors of houses stood ajar, and the place presented every appearance of sudden desertion. Since then the eighty-stamp mill burned, and all but two or three of the houses have been moved away; but the sound of the whistle and the thunder of stamps are again to reverberate among the pine-clad hills of that vicinity, so it appears. In the eastern portion of San Bernardino county the mines of Vanderbilt district have proven valuable and at least two of the companies there are operating successfully. Two new districts—Shadow Mountain and Gold Stone—have been discovered in that section, and near Cajon mountains gold has been found at the east and west end of the range.

There is a renewal of activity in the counties east of the Sierra Nevadas—in Alpine, Mono and Inyo counties. Many of the old mines are once more being worked by new owners or leasers.

The long-continued and almost unparalleled output of the Utica-Stickles group of mines at Angels Camp, in Calaveras county, has given an impetus to everything in that section, and many new enterprises of more or less promise have been promulgated.

In addition to the mines already mentioned in Amador county, there are several others deserving of more than mere passing notice. The Argonaut Company, whose property adjoins the rich Kennedy on the south, are sinking a three-compartment shaft, which it is intended to carry to a depth of 2000 feet before suspending operations in that direction. This shaft has been started in the hanging wall, and it is estimated that it will reach a depth of 1000 feet before encountering the veins, thus showing clearly the great faith of the company in their mine. These extensive operations are based on the result of work in the Kennedy, which is 2250 feet deep below the croppings.

A mile southeast from the Argonaut another deep shaft is being sunk by the Alma Company. On this same great fissure, between Jackson and Sutter Creek, a shaft has been sunk over 1000 feet on the South Eureka mine, and considerable other development done, representing an outlay of many thousands of dollars; and yet it is only recently that pay rock has been discovered, and the indications now are that the South Eureka will become as famous as some of its neighbors. Near Plymouth the Bay State is in bonanza and a mill is in operation. The Philadelphia mine, recently purchased by an English syndicate, is being developed, and at Nashville the same company has built a twenty-stamp mill on their mine there.

In El Dorado county there are several new enterprises, prominent among which is the Oro Fino or Big Canyon mine. It was here that a mill having 1400-pound stamps was erected. It does not appear likely, however, that this innovation is likely to become a permanent feature.

In Placer, Nevada, Butte, Plumas and Shasta counties there have been numerous new enterprises, notably at Iron Mountain.

In Siskiyou county there are over 400 operating mines, a large number of which are new. Trinity is now one of the foremost mining counties. The mines are mostly of the hydraulic class, which in this county and in Siskiyou have never been enjoined.

The revival of hydraulic mining in those counties where it has been prohibited by law will tend to very materially increase the gold production. There have now been about eighty applications made for permits to resume operations under the restrictions of the law regulating hydraulic mining. Of these more than half have been granted.

Although there has been such a revival of interest in gold mining in the State within the past year, the general result has not been effected in a marked manner. But the year 1895 will undoubtedly show a very considerable increase in the total gold production. A great deal of time has been spent in rehabilitating old mines, constructing machinery, etc., and getting ready to work, and the increased production may be expected to follow in the near future.

The silver mining industry is still centered chiefly in the Calico region, in San Bernardino county. The litigation so long pending has been compromised and the several properties placed under a single management, and it is currently reported that these mines are to be again operated on a large scale once more.

The New Almaden mine, the great quicksilver producer in Santa Clara county, after a period of depression, is once more in bonanza, and report indicates that this mine will again make a large output. The great quicksilver producers are now in Lake and Napa counties. In the former county the Great Western and Mirabel, and in Napa the Atna, are the great mines. Trinity county is also furnishing a considerable quantity of quicksilver. In this county the Altoona and Integral mines have come into prominence. Quicksilver occurs in many places in the State in unusual forms, in association with gold, etc., but these occurrences are of geological interest only.

Copper mining has declined materially within the past two years, the principal producers, at Copperopolis, having been shut down.

The output of other mineral products has fallen off in some instances, as in clay, chrome and manganese, and in the manufacture of paving blocks, but the increase in the output of building stones, such as granite, sandstone and marble, will more than offset any shortage of the other articles mentioned.

The mining or borax has continued uninterruptedly and indications are that the output will be materially increased by reason of the discovery of large deposits of rock near Calico which contain considerable quantities of calcium borate.

The mining industry as a whole, however, is most promising, and every feature of it points to a long continued era of prosperity.

Within the past two years electricity has been successfully introduced in mining in California, and there is no doubt it will in the future become a very important factor in mining economics, particularly in the transmission of power to points difficult of access or where fuel is expensive. Thus, in Mono county, an electrical transmission plant has been established at the Standard mine, which has for a motive force a mountain stream more than twelve miles distant from the mine. It is in practical and successful operation and effects a large saving in operating expenses.

The perfection and cheapening of metallurgical processes is also doing much toward assuring success. The cyanide process is evidently also destined to work wonderful results when more thoroughly understood.

W. H. STORMS.

San Francisco, January 21, 1895.

A New Mine Cage.

A. Gray, of Sheridan, Montana, has a new mining cage, now in use at the Hope and Leiter mines. The chairs are made a part of the cage and can be thrown in or out at will. The station tender can never leave the chairs in, as they fly back as soon as the engine takes the load off of them. They can be used in making repairs to the shaft, such as retimbering, etc., as they will rest on any set of timbers, and the men employed in the shaft can feel much safer with the cage resting on the chairs than if it were hanging by the rope or cable. Allowing the cage to drop on the chairs at a station is a source of trouble at all the mines of that district, as the chairs are now arranged. With this cage, it is claimed, the only way damage can be done is by dropping the cage into the sump or by hoisting it into the sheaves. With the old-style cage, the old bottom can be taken off and another bottom with the chairs substituted in about three hours. At the Leiter mine the cage was in running two and one-half hours from the time work began on the change, and it is claimed that it costs less to substitute the new bottom and chairs than it does to put in an ordinary set of chairs.

Effect of Failure of Coal Supply.

A hundred years ago the world got on nicely without the steam engine. In the last year of the last century there were but three steam engines in the United States, yet to-day a failure of the coal supply to existing engines would not only paralyze industry, but through the interruption of transportation of food products, and the stoppage of water works and sewage engines, would introduce widespread physical suffering.

Mining Reports and Mine Salting.*

NUMBER III.

By WALTER McDERMOTT.

I wish now to introduce another personal experience for the sake of the morals contained in it, and as bringing out some of the special risks to be guarded against in mine examination. The story is at my own expense, and may, therefore, be somewhat unusual in the transactions of a scientific institution. I am not afraid of the example being followed to the injury of the reputation for shrewdness of mining engineers generally. It is not pleasant to write oneself down as an ass in any form: and personal experience which, if related, might lead to such conclusions are usually kept as private as circumstances will permit. Some experiences which might be very instructive if published, but which naturally do not get known, are those arising from salting when the expert never knows himself of its occurrence.

A few years ago, an English mining engineer and friend of mine brought to me in New York—where I then had a testing mill and assay office—a series of average samples he had taken from a silver mine in the Rocky mountains, and also half a ton of the average ore for a milling test. The samples came out very well, the milling test showed no difficulty in treatment, and the engineer's report to his English principals was quite a glowing one. For financial reasons the purchase fell through in London, and a year later the owner of the mine called to see me about the property. I had been so well impressed with my friend's report on the mine, and the owner's description, that I made offers to purchase on behalf of an English company, subject to examination. Before going so far, however, I got a report from a mining engineer resident in the west, and whose name is well known, confirming the owner's statement as to quantity and average grade of ore in sight. In addition to this, I had copies of statements by two other western engineers, showing the mine to be valuable if the ore were worked by milling process instead of by shipment to smelters, as had been done in the past. On this I visited the mine and sampled it carefully, taking some 1200 lbs. of samples, and sealing the sacks in the mine by wire through and round the necks, and held by a special lead seal of my own. I wanted large samples to confirm previous milling tests, as the matter of treatment seemed an important one; but as I could not carry about me, and sleep with 1200 lbs. of ore, and no vigilance would prevent the possibility of value being worked into the sacks if once lost sight of, I took a special precaution against salting in the following manner. The ore occurred as a bedded deposit, and, outside of occasional pockets of good ore, was reported to be of an average assay value from thirty to fifty ounces of silver per ton by the different engineers who had examined it. It was a question of milling the full width of the bed, which averaged about six feet; and the appearance of the ore lent itself wonderfully well to the theory of its average value. I, therefore, took in addition to twenty-six average samples seven special full sack samples from different parts of the mine, each of which consisted only of large lumps of the poorer ore, without any fine admixture. The object was to have samples which could be readily cleaned when once in my own office, and, therefore, which would be unaffected by any salt introduced in a fine or liquid state into the sacks after sealing. With certainty that there had been no salting, if these lump samples showed a fair silver contents, there could be no doubt whatever as to the value of the deposit.

In this material world good intentions are by themselves very inadequate. My little programme, framed for my own protection, was in an evil moment slightly changed, and thereby ruined. Owing to pressure of enquiry for a preliminary report I decided to crush five of my seven test samples in a neighboring sampling works, and so satisfy myself as to the lower grade of ore which would determine the probable value of the mine for me. I took every precaution by cleaning up the crusher and rolls myself, and dusting off the lump samples, and crushing and quartering down to the assay samples, which I took in duplicate. One of the sets of samples I gave a local assayer who was I knew interested, and would not have been of course reliable if unchecked. The second set of samples I kept myself in a valise in my bedroom. Subsequent events showed that these private cheque samples were got at, and that the whole mining camp was honeycombed with a six years' standing conspiracy. I had still in reserve the two other lump samples sealed as taken, and which with the other twenty-six average samples were sent on to New York to await my return. As bad luck would have it, however, I was stopped by telegram on my return, and had to go farther west to examine another mine; and the samples arriving before I did, were crushed and assayed by my assistant in New York without the special precaution necessary for the two lump samples of cleaning before crushing.

During the night preceding the shipment of samples the gang interested worked into each sack a dose of extremely fine divided precipitated silver, which can be purchased in the west from leaching works using copper plate precipitation. In the final crushing and mixing for assay samples the "salt" became properly incorporated, and appeared only in the results. Investigation later showed that the lump samples alone contained naturally about two to three ounces of silver per ton, but when properly doctored they went from twenty to thirty ounces. As I cleaned and crushed my first five lump samples, no silver previously worked into the sack could have materially increased the assay of the big pieces, but when once crushed the salting could be easily effected, and, as before mentioned, my small crushed samples were got at afterwards independently. The two lump samples were doubtless given an extra dose before shipment to allow for loss, and my assistant in crushing them doubtless emptied the whole sacks into the crusher, perhaps even shaking them afterwards. There is not the least possible doubt as to the method of salting, because I found afterwards in every sample, by panning and the use of a microscope, that the value lay in the fine metallic silver which did not exist in the mine itself at all.

The presence of the metallic silver in the samples was discovered by me in course of milling tests, and its peculiar character so far raised suspicions as to lead me to endeavor to get a new sampling; but I was defeated by a concatenation of circumstances too involved for explanation here; and chiefly due to the skillful manipulation of the gang, who, with every appearance of willingness to help in any way, managed to block every step. In this course they were assisted by my principals, who pushed on for completion of purchase, and would not hear of any chance of error in view of previous reports by other engineers, and of the necessity of making payments at a fixed date. Nevertheless, within a few days of the completion of the purchase I sampled the mine again; the first assays settled the matter, and I cabled the fact of the whole business being a swindle to the purchasers, and started on the uphill work of bringing the matter home to the gang. Now salting is not a thing which a man does by the roadside while his neighbors are going to church; and unless one of the conspirators should "peach," it is always very difficult to make an absolute case for trial. Owing, however, to the form of "salt" introduced into my sacks, which I was able to separate and exhibit by microscope slides, and to a vast amount of circumstantial and detective evidence collected little by little, I was able, after four years of working and fighting, to get a sweeping judgment against the vendors of the mine. Of the three "honorable gentlemen" who were principally interested in the swindle, one was Mayor of a flourishing town, who has, since the judgment, disappeared from view. Another, who did the scientific part of the work, is, I believe, enjoying a position of political trust in his country; for, in a free and progressive country, under Irish rule, the personal misfortune of being found out and convicted does not spoil a citizen's political career.

From facts and evidence in this case I am able to throw some light, not only on my own shortcomings, but on the misfortunes of three other engineers in respect to this same property, all useful here for the purpose of showing variations in the art of salting. The English engineer had not even sealed his samples, but had tied his sacks with string, and had crushed and sampled the ore in a local mill before shipping to me. Before this, however, the gang had been able to calmly empty out his average samples and fill his sacks with the best selected ore of the mine, so that no introduction of foreign matter was necessary. In my milling tests on his samples I had made no microscopic examination as I did later on my own sampling; and when I found the metallic silver (which I supposed to be native silver, but was still suspicious of) I at once looked for the previous assay samples of a year before. Had I been able then to find these the game would have been up; but here, as at one or two other turning points in the case, it is clear that the devil had a retaining fee from the other side, and was earning it. We usually kept small assay samples of all tests for a year, and then threw them away, and the last cleaning out had been down to and inclusive of the indentical samples I wanted. Curiously enough, some months afterwards a single sealed bottle of the mixed average of all the samples of the English engineer was found, and made useful evidence in the case, for it contained none of the metallic silver which constituted the value of my samples.

An American mining man who took small samples and sealed them with the end of his pen-knife, as a distinguishing mark, took the samples himself to the Express Company's office at the nearest railway station, but the agent of the Express Company had been persuaded to let the owners of the mine take a look at these sacks of ore in his charge. They opened the sacks, changed the ore, and resealed the packages, using a pen-knife, as the expert had done.

The experienced western engineer—whose report had been received by me before I first went to the mine—had taken his samples carefully, quartered them down in the mine to small samples, put them in sacks, and sealed them with his own seal, having his initial on it. He also delivered his samples personally to the Express Company, and felt safe in consequence. At midnight, two of the salting gang and the Express Company's agent were at work on these sacks. To avoid breaking the seals, which they could not duplicate, they opened the sacks from the bottom, at the joining, and neatly sewed them up again after substituting a more satisfactory grade of ore than mere average samples of the mine were likely to prove. A sack which has the sewing of the joining inside, and is sealed at the mouth, cannot be opened at the bottom and re-sewed with absolute impunity; but the opening need not be large, and with neat work, and the big chances of the expert having absolute confidence in the Express Company or post office, after he has personally delivered his samples, the business can be done. It certainly succeeded in this instance up to the salter's full expectations. The enterprising gentleman who was directing operations, evidently thought, however, that cutting seams of sacks and re-sewing was more fatiguing and not so artistic as duplicating seals, because he had the foresight to take a copy of the impression of the seal on the sacks, and get one made for himself. The expert's initial was not his, but he explained to his friends that it might come in useful some day.

Besides these three experts and myself, there had previously been a professor of geology who had made a good report, on which a company had been formed, the mine purchased, and some working capital raised. It took this company some time to find out what sort of a property had been secured, because the head of the gang had bargained to be retained as manager. He judiciously steered the business into debt, after getting all the cash forthcoming for working, then sold the whole property out for a song to one of his confederates, and started out on the search for fresh "suckers." I don't know how the professor was had, but probably he was occupied in the more important geological questions in connection with the deposit, and asked the vendors to get him some good, fair, average samples by which to determine the value.

The microscope or a very strong glass is often of great service, as shown in the foregoing case. In silver ores the silver-bearing minerals can often be washed out and identified, and with gold ores the color and form of the metallic particles are sometimes suggestive. Once in Dakota I was taken to see a vein said to be rich in silver, but the appearance of the vein matter raised an immediate doubt as to what form the silver could be concealed in. By panning I obtained some native silver, but when examined under a glass some of the pieces showed traces of native copper attached. The only place I know where native silver and copper occur actually welded together is the copper region of Lake Superior; and on questioning a little the honest miner who was my guide—and who kindly assisted in crushing some samples—I found he had formerly worked on Lake Superior. No great intellectual effort was then necessary to account for the occurrence of the silver in the very unpromising looking vein matter.

In the case of panning tests on gold ore, or gravel, or for precious stones, it is of course comparatively easy for any one who is allowed to be within a short distance of the expert to get in his salting work, and solitude is the only protection. Among the known methods worth a passing mention are the following: The salter may use a quill toothpick as a weapon for long-range shooting, or have gold dust in his nails for short range, or charge his pipe or cigar and not watch where the ashes fall. Cases have been known of gold pans prepared in advance by a valuable varnish which gradually rubbed off in use. Probably some of our members can describe other varieties of means for reaching the same end; and although it is not possible to mention all the devices, there may be some utility in putting on record for others the better known ones, for it is certain that many young engineers start out with confidence of much learning, ready to undertake responsible examinations, and without any clear idea of the dangers they are courting. A man may acquire a fair amount of practical experience, and confidence begotten of the same, without happening to get into surroundings of any real danger, and so when least expecting it may yet be nipped. All men of experience agree that the only absolute protection is solitude, and that trusting to knowledge of the old tricks or to personal watchfulness is quite insufficient if any person is immediately around.

*Paper read on Dec. 19, 1894, at the meeting of the Institute of Mining and Metallurgy.

The Panama Canal.

The great De Lesseps Panama ditch is a melancholy wreck. The wharves are falling into the water and acres of machinery are rusting to dissolution. On the isthmus are nearly 1000 miles of steel track with locomotives and thousands of dump-carts, now half hidden in the tropical growth. Seventy-six great steam shovels stand side by side in the excavation buried in luxuriant vegetation, so that only the gaunt arms stand up above the green. While 200 locomotives have been housed, it is estimated that nine-tenths of the millions squandered on this prodigious enterprise is going to waste. Much of the excavated land has been washed back into its original place, and the great scar on the face of the Panama isthmus is rapidly fading from view.

Along the Colorado River.

To the Editor:—To one who has never examined or even seen the mines bordering on the Colorado river from Yuma to the Needles, they are a revelation. Some time since, while at the San Xavier in Tucson, Arizona, a very prominent mining engineer, knowing that I was interested in mining, asked me if I had ever been along the Colorado. "If not," said he, "do not go back to New York until you have seen that wonderfully rich country in gold, silver, lead and iron." Tin had not then been discovered in any quantity, said he. I have spent several weeks in a careful examination of the different mining districts, and as a result I can say that within the next five years the country between Ehrenberg and Yuma will surprise the world in its output of gold, silver and lead. Copper does not amount to anything, but iron, manganese, zinc and other minerals will come in time, when cheap transportation and living can be had. The great cement belt of gold east of Ehrenberg, the gold veins nearer the river, the great gold veins at Picacho—the finest free-milling belt of gold ores I have ever seen, together with those farther back from the Colorado, will astonish us all, while the rich silver and lead districts of Castle Dome, Eureka and Silver districts will open the eyes of our silver-producing sections. Just at present but little can be done on account of the high cost of provisions and the exorbitant rates of freight. Think of it! Five cents per pound for beans, potatoes, flour, barley, or oats; $23 to $30 per ton for hay; $40 to $50 per thousand feet of lumber; eight cents for onions and ten cents for all other vegetables; twenty to twenty-five cents for bacon, ham and lard; fifteen cents for sugar; fifty cents for coffee. In these times the miners cannot stand it and live. But the grand keynote has been struck by a company of wealthy capitalists, whose names are purposely withheld from the public at present, who have at Barrier Rocks on the Colorado river, near Picacho, a large millsite for water power for the largest electric plant ever constructed. The river at this point is divided into four channels or waterways by great piers of rock thirty-five to seventy feet above the river and having a base of from 100 to 500 feet square, being 75 to 125 feet apart and extend out into and down the river far enough to give room for the construction of from 100 to 150 distinct water wheels which can be built so that they will stand in lines or series of three or four each, on one or different shafts in line. At first, one wheel or a series of wheels will be put in and be connected to a 1000-kilowatt generator, the largest ever built. Lines will be put up first to the mines and mills which, by the time the wheels are ready, will be in operation. Then, as fast as the demand increases, other wheels or series of wheels will be put in. These wheels will be suspended or hung from iron or steel bridges which will rest on the great piers which Nature has already constructed. The entire work will be of iron, steel and aluminum. In short, the plan is this: To furnish power and light for running all the mines, mills, furnaces, smelters and reduction works within a radius of 100 miles; to run a narrow guage railroad which will be built to connect the mines and mining plants with each other; to run steamers from the Needles to Yuma and the Gulf; to pump water for irrigating all the valleys along the Colorado, and also into the canals that will be built to irrigate the great valley of Colorado below but adjacent to Yuma; to supply power to every manufacturing industry, to every farmer, fruit grower and mechanic who may want it and who shall settle along any of the lines of the plant within 160 miles of the main station. Will it be done? Yes, sir; and within the next five years, mark my words. Do you know, within the area named there are at least 1000 good mines that will furnish ore for nearly 10,000 stamps or their equivalent in crushers, smelters and other reducing appliances; and that from 40,000 to 50,000 horse power can be developed at Picacho and Barrier Rocks. There is no other such a place on the Colorado, at least below the Needles. While at Picacho I found that it cost the great English pumping plant $132 per day for wood alone, not counting the handling of it. The electric company will furnish the same power for $16 per day. No wonder the pumps are idle at the present time. "Yes," said he, "you will see all this done, and the greatest mineral belts in the world put to production." I wondered. I started as soon as I could. I have spent weeks in the careful examination of that grand mineral section. All he told me is true. Castle Dome takes the lead for lead and silver; Silver district for silver, but Picacho and Ehrenberg for their free-milling gold ores—the former for its immense veins 20 to 100 feet wide and the latter for its cement belt, which pays from $6 to $10 to the mill and can now be mined and milled for $1.10 per ton in a thirty-stamp mill, but will be done for forty-eight cents per ton when the electric plant gets to work. This, of course, is in large mills. Barrier Rocks is a wonderful place. It could hardly be better adapted for its work if built expressly for the great electric plant which will soon crown its summit. The opening up of these vast regions is only a question of time. Moneyed and mining men, experts and mining engineers from Montana, Idaho, Colorado and the Dakotas are quietly coming into these sections, carefully examining the mines and minerals, getting the price of properties and reporting to their principals, and in all I have met I have found but one man, a Montana bloater who did all of his prospecting in a boat with a well-filled demijohn, claiming that he was sent here by all the millionaires in Montana, and he condemned everything, yet tried to get a bond on one of the best mines on the river. Before I go I may report again. You can rely upon this section on the Colorado coming out all right in a little time.

Ehrenberg, Ariz., Jan. 8, 1896. Engineer.

As to Mr. Silberstein's Theories.

To the Editor:—Your editorial "Not Proven" in to-day's paper is very well headed. You make Mr. Silberstein father every man's theory as well as his own, and, as stated therein, he is this, that, or the other. You will please allow me to correct your premise from which you drew your conclusions. In the center of the article referred to, you quote Mr. Silberstein as follows, which is correct: "Motion is actually inherent in the planets themselves, as in every substance or body existing in the universe." What follows is not his belief at all, but Newton's, and similar beliefs. Mr. Silberstein, in the article you criticise, was stated to have said there are only *two* possible causes that would explain the constant motion of the planets and wherein lies the propelling force: First, as stated above—which is Silberstein's; and, second—which is Newton's and his followers, and which, in your editorial, you impute to Silberstein, viz: That motion was originally produced and is still being produced by a force outside of the planets; that a body has not a natural motion in it, and when it moves, the motion must have been produced by a force outside of it.

You will notice that this puts quite a different phase to the question, and is clean cut. In either case, the motion of the planets, as established by Kepler, cannot be explained by Newton's principles.

Mr. Silberstein believes the original atom had a double force, originated by radiation from the center of its sphere, necessitating its elliptical path; and when joined in combination with other atoms in their afterwards concrete form, its motion and velocity increased according to its mass centrality of motion generating and accelerating during its planetary potentiality. Consequently, it is as impossible to believe a planet was sent into existence "full fledged" as it is to believe man was suddenly thrown into existence full fledged, with all his faculties matured, mentally and physically. If Kepler, by mathematical calculation, correctly inferred what the motion of the planets must be, may not the philosophies of the Law of Evolution to-day infer from its application on known things on the earth what might necessarily be the planetary condition of the earth in its formative stages?

San Francisco, Jan. 19, '95. E. W. Keeler.

[The above is gladly given space, for the theme touches upon most interesting topics of discussion. The Press must be pardoned for having honest doubts regarding the solidity of the scientific strata on which Mr. S's theory rests. It is not a matter of creed nor dogma, and skepticism is allowable to us. It seems advisable to suggest (and the suggestion is made with the humility that accompanies imperfect knowledge) that, in discussion of this particular matter, it is desirable to keep in view the line between pure metaphysics and pure science.—Ed.]

Granite as a Fertilizer.

To the Editor:—In an editorial in to-day's issue, you notice Mr. Hensel's "stone meal" as a soil fertilizer, and it recalled an incident I read about as a result of a similar discussion, which was whether pure granulated granite would sustain vegetation. This person took a flat rock, protecting its edges, and covered it with granulated rock twelve inches deep in which he planted his seed, which matured of its kind in appearance as of ordinary growth, particular pains having been given to keeping it well watered during growth. And in this connection I would speak of an incident mentioned by Prof. Mapes some years ago in New York which came under his own observation, viz., that in a deposit of magnesia, when pulverized, it was found to act as a cathartic of a drastic character. It was afterwards submitted to a trituration of 100 times and became one of the mildest of laxatives. Whether the disintegration of rock by heat, frost, ice and rain has more or less virtue than when reduced by artificial means may not be easy to decide. A proper mixing might do whenever experiment determines its value.

San Francisco, Jan. 19, '95. E. W. Keeler.

The Future of Gold.

In the United States the production of gold has been very uniform since 1887, never varying much from 1,596,375 ounces, or $33,000,000, until 1893, when it amounted to 1,739,323 ounces, or nearly $36,000,000. It is noteworthy also that the gold output of this country in 1893 was the largest since 1880, and came within 1677 ounces, or about $45,000, of equaling the yield of that year. The net increase of the gold output of the United States in 1893 over that of 1892 was $2,940,000. The increase was most noteworthy in Colorado ($2,227,000) and Montana ($684,613). On the other hand, the product of Nevada decreased $613,000, out of a total decrease in six States of $928,785. It is too early yet to state positively what the gold product in the United States was in 1894, but this much is certain, that it will largely exceed that of 1893 and probably reach $43,000,000, an increase of $7,000,000 over that of the latter year.

The tendency of all the gold-producing States is to add to their annual product. The repeal of the purchasing clause of the act of July 14, 1890, has stimulated the search for gold, and a good share of the increased gold output in 1894 will be traceable to it. There are no indications whatever of a falling off in the future of the productiveness of the gold mines of this country, although, considering the rapid growth of the South African production of gold, it is difficult to predict how long the United States will maintain its supremacy as a gold producer. New mines will, of course, be discovered here, but the discovery of such mines is still more likely in Africa. Much will depend on their relative richness. So far as can now be seen, says Director of the Mint Preston, the greatest hope of a largely increased gold product of the United States in the future lies in the removal of all restrictions on hydraulic mining in California. That has already been done to some extent by the so-called Caminetti Act, passed March 3, 1893. If means could be found to remove all restrictions on this class of mining—and that may be a possible achievement—it has been estimated that the deposits in that State would add something like $500,000,000 to the gold stock of the world.

In Australasia the production of gold in 1893 was 53,698 kilograms, representing $35,688,620, against 51,398 kilograms, representing $34,158,966, in 1892, an increase in the former year of 2300 kilograms. In like manner 1892 showed an increase of 4152 kilograms over 1891. Indeed, ever since 1886 it may be said that the gold output of the Australasian colonies has been continuous. The falling off of the yield in 1890 and 1891 from that of 1889 can scarcely be said to have broken the continuity referred to, for both 1892 and 1893 show a marked increase over 1889. The product from alluvial deposits is continually decreasing in Australia, and that from quartz mining increasing. The alluvial deposits yield only about one-third of the total product of Victoria and not five per cent of that of Queensland. On the other hand, "the deep leads," which are only deep alluvial beds, but which must be worked like veins, are far from being exhausted. Thus far they have been operated only to a very limited extent. Moreover, a large number of quartz mines have heretofore been abandoned as soon as the pyrites was reached. There is no reason why work on such mines should not be resumed, with the aid of the newly discovered processes which have proved so successful in South Africa, and with equally successful results. Everything considered, it is to be expected that the production of Australasia will continue to increase at about the present rate at least for an indefinite period.

Russia next claims our attention. Here, too, where the gold yield is almost exclusively from alluvial deposits, the production of that metal has been continuously increasing since 1886, as witness the following figures: 1886, 30,872 kilograms; 1887, 30,232 kilograms; 1888, 32,052 kilograms; 1889, 35,970 kilograms; 1890, 35,296 kilograms; 1891, 35,356 kilograms; 1892, 37,325 kilograms; 1893, 39,804 kilograms. The continuity of this progression is broken only in a single year. It is impossible, however, to venture any prediction as to Russia's output of gold in the future. The circumstances on which it depends are too many—legislation, the price of bread, the seasons, and the course of the paper rouble. Reasoning from analogy, however, one would be inclined to believe that the production of gold in the great empire of eastern Europe would continue to increase for years to come. Again, there is India. Outside of the great producing countries—the United States, Australasia, Russia and South Africa—the increase in the production of gold has nowhere been more rapid: 1886, 20,383 fine ounces; 1887, 15,464; 1888, 32,729; 1889, 72,691; 1890, 96,739; 1891, 120,691; 1892, 160,525; 1893, 184,477. The remaining countries to which I shall direct the attention of the reader are the three Guianas. Their gold yield was as follows: 1887, 1802 kilograms; 1888, 937; 1889, 2348; 1890, 3186; 1891, 5026; 1892, 6185; 1893, 6439.

The production of the world in 1886 was 159,494 kilograms; in 1893 it was 243,006 kilograms; but,

great as was the world's gold output of that year—greater than that of any other year in the world's history—I believe that that of 1894, and of a series of years to come, will be successively and progressively greater, and that what was said by the writer of the world's gold product in 1893 in the Report on the Production of Gold and Silver in that year, will, with the change of a few figures, be true of that series. He there uses these words: "The world's output of gold in 1893 was the largest in history, amounting, as it did, to 234,006 kilograms, of the value in round numbers of $155,522,000."

Meadow Lake Again.

It is reported that "there will be a great rush to the Meadow Lake district when the snow shall have disappeared." 'Tis nearly thirty years since that famous district first attracted public attention.

In 1865 the excitement began. Lots were sold by the California Company "to actual settlers" for $25. In the early part of November, 1865, the majority of the new home seekers, afraid to spend the winter in the Sierras, left for more congenial climes. By the first of December the country was covered with snow to a depth of five feet. The months of March, April and May, 1866, were of unprecedented severity at Meadow Lake. All traces of trails and highways were obliterated by the heavy snowfalls. As an evidence of the character of the storm, it may be stated that from the 20th of May to the 1st of June there was a constant snow.

By the end of June, 1866, there were 4000 people in the newly established town. Everything was excitement and activity. The sole topic of conversation was ledges, stocks and town lots. For a lot 60x80 feet on any of the principal streets from $1500 to $2500 was asked, and in many cases paid. Small tenements rented for $200 per month, and rents everywhere were proportionately high. Lumber cost from $50 to $75 per thousand feet. A stock board, composed of thirty members, was organized. This may be regarded as a unique transaction, considering that there was not a single mine in operation at that time.

During the year four good roads were opened from the town—one leading to Bowman's station, another to Jackson's, a few miles distant; a third to intersect the main Henness road at a point near Truckee Lake; a fourth connected with Cisco, on the Central Pacific railroad, bringing the residents within a day's ride to San Francisco. Eight mills were erected for the reduction of ores, with an aggregate capacity of seventy stamps. The construction of these mills incurred an expenditure of $200,000. Two furnaces for the roasting of ores were built, and Platner's chlorine process was used at one of them. In 1869 Burn's process created some excitement and was the means of spending a large sum of money, but all to no purpose. In 1873 O. Maltman placed some machinery into the U. S. Grant mill for working the sulphurets, but the plan was abandoned.

The winter of 1866–7 was a most severe one, the snow falling to a depth of twenty-five feet. But a large number of the residents enjoyed the pleasure of being thus domiciled, whiling the weary hours by bringing into requisition indoor pastimes of every description. Others endured the hardships and privations in the fond hope of regaining some of the capital they had invested. In this they were doomed to disappointment and despair.

In 1866 the Meadow Lake *Sun* was established by W. B. Lyon, H. G. Rollins and Judge Tilford. During its existence, which lasted only a few months, it earnestly and consistently advocated the superior claims of the town as a "rich metalliferous district." By 1870 Meadow Lake was almost deserted, all that was left being empty structures. On the 27th of September, 1873, a fire originated in the Excelsior hotel, which soon laid the whole town in ruins. Only two houses were left to indicate the spot where once excitement reigned and $2,000,000 were absorbed in laying out this summit city. In the zenith of its prosperity there were twenty saloons and three hotels.

It is estimated that during the summer of 1865 1200 locations were made in the district, containing in the aggregate more than 1,200,000 feet of ledge rock. In the excitement which prevailed locations were made all over the country. Bowlders, masses of granite, rocks of every description assumed to the distempered fancy of the prospectors the shape and outlines of a quartz ledge, and were duly entered upon the Recorder's books. The ledges, lying even with the masses of granite around them and capped with a species of mineral which is not pure quartz or country rock, are traceable by broad stains of a dark, reddish hue. Under the circumstances it is not at all surprising that parties whose attention and efforts were directed to other purposes than search for gold should have failed to discover the existence of treasures so strongly concealed by nature. During its short career some thirty mines were developed to a depth ranging from 30 to 240 feet. It is to be hoped '95 will prove more satisfactory to the treasure seekers at Meadow Lake.

The Manufacture of Aluminum.

The suit between the Pittsburg Reduction Company, owners of the Hall patent, and the Cowles Electric Smelting and Aluminum Company, was recently decided by Judge Taft, United States Circuit Court, Ohio, in favor of the Pittsburg company. The judge in his decision gives the following regarding the Hall electric process for making aluminum:

Electrolysis is a process for separating a chemical compound into its elements by passing through it an electric current. The current is effective for this purpose only when the compound is reduced to a liquid state, either by solution or fusion. The compound, which is decomposed by the current, is called the "electrolyte."

Aluminum is a metal which was first isolated by Wohler in 1827. There is great difficulty in obtaining the pure metal from its compounds, because of the tenacity with which it unites with other substances. The compounds of aluminum are very abundant in nature. The most common, perhaps, is the oxide of aluminum, called "alumina," one molecule of which is composed of three atoms of oxygen and two atoms of aluminum. Alumina is insoluble in water and practically infusible.

Fluorine unites with the metals to form fluorides. The fluoride of sodium and the fluoride of aluminum, united, form what is known as the "double" fluoride of aluminum and sodium. There are several minerals found in nature which are double fluorides of aluminum and sodium, of which cryolite is much more common than the others, and is found in large quantities in Greenland. Its uses are so extensive that it has become a well-known article of commerce.

More than fifty metals are known to chemists. When one of these is united with non-metallic substances, and the compound is reduced to a liquid state by solution or fusion, and subjected to an electric current which decomposes it, the non-metallic element of the compound will be drawn by the current to that point in the bath where the current enters it from the positive pole, called the "anode," and the metal will move in the direction of the point where the current leaves the bath for the negative pole, called the "cathode." Metals differ, however, in the ease with which the current can draw them to the cathode, and when one is more sluggish than the other in yielding to this influence, the one is said to be more electropositive than another. Scientists have arranged all known metals accordingly.

The only metals more electropositive than aluminum are magnesium, calcium, strontium, barium, lithium, sodium, potassium, rubidium and caesium. All other metals yield more readily to the current. When several compounds in solution or fusion are electrolyzed, the current will attack and decompose that compound whose parts are least firmly united, or, as the phrase is, which is least stable. As might be supposed from the foregoing, the more electropositive a metal is, the more stable its compounds are likely to be. Alumina is so common in nature that every one, in a desire to get pure aluminum, would naturally turn to that as one of the simplest of its compounds; but the fact that the oxygen has proved to be so firmly united to the aluminum as to resist the action of the highest heat, has been very discouraging to chemists. Hall, the original patentee of the patent in suit, was a resident of Oberlin, Ohio, and a graduate of the college of that place. He had a strong taste for chemistry, and after leaving college, in 1835, gave his attention, among other things, to the aluminum problem, which had baffled so many before him. He conceived the idea of obtaining aluminum from alumina by electrolysis, and concluded that, if he could find a bath made up of compounds more electrically stable than alumina, which would freely dissolve alumina, the application of the current to the mixture would precipitate the aluminum upon the cathode, and would free the oxygen at the anode. He discovered that the fluoride of aluminum, when united with the fluoride of any metal more electropositive than aluminum to form a double fluoride, would, when heated to fusion, dissolve alumina as freely as sugar will dissolve in water, and that an electric current passed through the fused mixture would deposit pure aluminum at the poles. Hall took out one patent for the process, in which he used a double fluoride of sodium and aluminum, and in this patent he also claimed the general process broadly, as we have stated it above. This is the patent in suit. He also took out other patents, as permitted by the practice of the Patent Office, covering the process when the fluorides or other metals more electropositive than aluminum are used.

The two claims of the patent in suit which are here involved are:

1. As an improvement in the art of manufacturing aluminum, the herein-described process, which consists in dissolving alumina in a fused bath composed of the fluorides of aluminum, and a metal more electropositive than aluminum, and then passing an electric current through the fused mass, substantially as set forth.

2. As an improvement in the art of manufacturing aluminum, the herein-described process, which consists in dissolving alumina in a fused bath composed of the fluorides of aluminum and sodium, and then passing an electric current, by means of a carbonaceous anode, through the fused mass, substantially as set forth.

The Management Criticised.

To the Editor:—I've had the pleasure of reading an article in your paper in the defense of miners. It is the nicest article I ever read and to the point. I wish you would also write up something of the same kind in defense of the mechanical engineers: those who served their time legitimately, before going out to run engines, and have to compete with those stoppers and starters, sage-brush engineers, who know just enough to stop and start an engine and carry steam, and in a very knowing way talk engine to the *expert* superintendent, who, as a rule, knows less about an engine than they do, except in a saloon or card-room. Here and New Mexico are the worst places I was ever in for that. For instance, a superintendent will come into town, and he wants to hire an engineer (he means engine runner or fireman runner). He finds one, and says: "Do you want a job running engine?" "Where?" "Seventy-five miles from here." "What do you pay?" "Four dollars (sometimes $3.50). You can come out on the stage." "All right, I'll be out there." Now comes expense: $12 stage fare, $30 for bedding, etc. When you get out there, you find the accommodations are not fit for Chinamen or Hungarians. In bunk-house or boarding-house there is no distinction between engineers and common laborers. Mexicans, Indians, Hungarians and white men all jostle against each other, and their behavior is like so many hogs in the dining-room or sleeping place. After you're there two or three days there's no wood wheeled up for you. You inquire the cause: the superintendent is going to town, the wood wheeler is going to hitch up his team, so there's nothing else to do but to wheel wood or stop the mill. The engineer takes the situation in at a glance, doesn't want to make a kick till he has at least made expenses, and, like the burro, grins and stands the abuse. The next day the wood wheeler isn't there. Cause: the car runner is sick and he must take his place. The old man (the boss) says you must wheel your own wood. So they have virtually rung in another's work on the engineer. In a few days Mr. Superintendent wants to know how much wood you are burning. You measure it up, and find you are using just three cords, $18. "Ah, that's quite a lot of wood, isn't it, for the work we have to do (ten stamps, four concentrators, one rock breaker). I wish you would overhaul that engine and see if you can't improve on that." (Nothing said about improvements or saving when hired in town.) I go to work and make a change on the engine and save a cord of wood, $6. Do I get anything for it, or for knowing more than a fireman runner? No, not even thanks. Now, sir, why shouldn't a mechanic be paid for his brains as well as a doctor or a lawyer? The only reason I can assign is because the expert superintendents (who perhaps were preachers in Cornwall or Colorado) don't know the difference between good men and indifferent ones, and they themselves reap the benefit of your knowledge and saving. Does the company? Is it any use for a man to go into a shop to learn a trade (from boyhood to manhood) and find when he leaves the shop that he has to compete with stoppers and starters, who know much with their mouths and but little with their hands?

I was in the Vulcan Iron Works in Pete Torquet and Joe Moore's time. I claim to be the originator of the Young Mechanics' Evening Drawing School, going in my overalls at noon to one of the Board of Education, to see if he wouldn't meet with the Legislature and try to get an appropriation for that special purpose. At that time about a dozen of us apprentices used to meet in one of your old printing rooms, on Clay street, between Sansome and Battery, and a draughtsman from one of our shops taught us five nights in a week. We afterwards moved to one of the rooms in Lincoln school, which was quite a distance to pack a large drawing-board and instruments, and the scholars fell off in consequence. About that time business in the shops got very slack and I steered for the mountains, where I've been almost continuously.

Engineer and Machinist.

Lynx Creek, Yavapai Co., Arizona.

B. C. Brown, of Kingsley, Or., suggests that there might be economy in having inserted teeth in crosscut saws, as well as circular saws. It would seem so at first. But while a circular saw (made for inserted teeth) would cost from $50 to $100, and a new set of teeth only $1.50 (perhaps), the ordinary crosscut saw (certain dealers and manufacturers say) costs but little if anything more than the teeth would. The scheme would work, but they say it wouldn't pay.

Lord Kelvin says that the internal heat of the earth has nothing to do with climates. The earth, he thinks, might be of the temperature of white-hot iron 2000 feet below the surface, or at the freezing point 50 feet below without at all affecting a climate.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XVIV.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

1866.—Mr. Charles Stott began work on Santa Paula creek, Ojia ranch, eighteen miles east of Ventura, Ventura Co., at the base of Sulphur mountain, and erected a refinery on a small scale. He made several thousand gallons of illuminating oil, and then gave up the enterprise because it did not pay. October 22d the San Francisco *Alta* published an article on petroleum and refineries, giviug Chas. Stott the credit of refiniug the first oil in the State.

In this year there were two refineries established in San Francisco, one owned by Hayward & Coleman, the other by Stanford Bros. Neither of these establishments achieved any considerable success, and were eventually abandoned.

Mr. Polhemus, also, had a refinery at Los Angeles. A portion of the crude oil which he refined was obtained from the wells near the town of Los Angeles, aud some was hauled by teams from Pico canyon.

Mr. Hughes bored for oil in Pico canyon and struck a flowing well at 140 feet, but the tools became fast and could not be extricated.

A well was sunk on the Potrero iu San Francisco, but the result was not satisfactory. There was considerable excitement about oil during this year.

The "Pioneer Petroleum and Refining Co.," of San Francisco, was incorporated. Chas. Stott, David Hunter aud H. P. Wakelee, trustees.

Chas. Stott had a refinery, corner Chestnut and Taylor streets, San Francisco.

The Adams well, near Mt. Diablo, in Contra Costa county, in a second shaft at a depth of 100 feet, encouraging indications of oil were met with, and at 125 feet the drillers encountered hard rock, beneath which they found a stratum of oil from which five barrels were pumped in two days.

In Santa Cruz county the Petroleum Oil Company put up retorts for refining their oil, which produced 200 gallons three times a week.

In Colusa county a well was suuk, 460 feet in depth. At 50 feet a stratum of thick oil (maltha) was met with, another at 112 feet and a third at 117 feet. The well filled up with salt water, through which bubbles of gas arose, sometimes with violence sufficient to throw water out of the well. This well was situated at Oil Center, six miles east of Sulphur creek.

In Humboldt county, work was discontinued on Mattole creek. The "North Fork" well was down 230 feet; at 207 feet oil was struck, which continued. The following are the names of the most important wells in the county at that time: Jeffries, Joel Flat, Upper Mattole, aud Irwin Davis. The latter was down 655 feet aud had oil in coarse sandstone.

The Buena Vista Oil Company of Tulare Co. (uow Kern) was specially active during this year; and while work was subsequently suspended, it is now known that the deposits have very considerable prospective value, which in the near future is likely to be realized. The oil claims comprised some 1200 or 1600 acres on the west side of Tulare valley. The exact locality was sections 19, 20 and 29, township 30 south and range 22 east and sections 12 and 13, range 21 east, San Bernardino base and meridian. The compauy set a still with a daily capacity of 300 gallons near a large spriug of good water, three miles from the oil springs. The company attempted to sink a well for water in a more convenient location, but did not succeed in finding it. For thirty feet or more the formation was alternate layers of shale, sand and asphaltum; below thirty feet a three-foot stratum of asphaltum was met with, very difficult to penetrate, but no water. Two adobe buildings were erected—one for the workmen and one at the refinery.

Iu 1865 Mr. Stephen Boud and Mr. E. Benoist commenced a well on the flat below the tar springs on the company's claim. At a depth of eighteen feet, in raising the auger, the workmen turned it the wrong way and unscrewed the bit, which accident put an end to the work. The company's refining works were under the management of Mr. W. O. Sleeper, from whom I obtained information as to mode of operations. The crude oil was taken from pits or shafts sunk from sixteen to eighteen feet deep. There were also several natural shallow basins or ponds, which, when emptied, soon filled again with maltha and water. At the bottom of the artificial pits a quicksand of oil, water and saud was met with, which could not be overcome by curbing or otherwise controlled. An open cut was then made into the hill, but a solid ledge or bed of sandstone and thick beds of asphaltum were met with. This cut was from seven to eight feet deep and four feet wide, from which some maltha was obtained and distilled. At one time it was thought that from the shafts aud open cut five to eight barrels per day could be collected. Oil from the surface had a density of 10° to 12° Beaume; at the depth of ten feet, 12° to 14°; and at thirty feet the oil was as light as 21°. Three hundred gallons of crude maltha were pumped from the oil wells each day, which was renewed the uext. One hundred gallons of this material yielded by actual working: Buruing oil, 35 gals.; lubricating oil, 45 gals.; residue (mostly coke), 20 gals. Three or four thousand gallons of refined oil were produced in the distillations. The following results were obtained: First run, 5% to 7%, from 47° to 43°; second run, 40%, from 40° to 30°; third run, 35% to 40%, with a density of 30° to 16°. The residue iu the still was soft asphaltum, which, while hot, could be drawn off without difficulty. Many obstacles were met with by the compauy which caused the work to be abandoned. Freights were high, being $60 to $70 per ton to San Luis Obispo and from $15 to $20 more to San Francisco. The nearest fuel or lumber was the forests on mountains thirty miles south. In October a newspaper stated that the Buena Vista Co. had produced 300 gallons of heavy lubricating oil from black oil. The following are extracts from the report of E. Benoist to the company:

After spending some time in viewing the location selected by you, I erected the machinery for the purpose of horing. Within a few feet of the surface, I found the quality to show 12°, and at fifty feet the gauge showed 20°, which is really better than calculated at twice that depth. The oil at this depth is of a greenish hue; and judging from the quality, I did not hesitate to say that, in seventy-five or eighty feet, oil can be produced to reach a standard of 25°. From the general appearance of the surface and the ground through which the boring was done, I feel assured that it is favorable for work at a great depth; but from the easy flow acquired at fifty feet, a number of wells could he made at that depth to produce 50,000 gallons per day at a small expense.

Had the requisite machinery heen at hand, I should have gone to a greater depth, hut deemed it advisahle not to do so at this time, as the quantity of gas issuing would make it difficult to prevent ignition of the oil, which circumstance in your case, where it is so abundant, would entail serious loss. The remedy is simple and inexpensive for prevention in such cases provided you have the material at hand.

This oil is entirely free from any water, salt or other impurity and is very limpid.

I have in transit 100 gallons of crude oil from which I shall make samples of light and lubricating oil upon my return to San Francisco, for inspection by any parties who wish to satisfy themselves in regard to its quality.

I have also discovered, in connection with the oil, a vast bed of what is called Albertine coal, hut I will call it concentrated oil. Thousands of tons of this material can be easily extracted and will he valuahle for fuel for steamers and also for the manufacture of gas. (This mineral described hy Mr. Benoist was undouhtedly crude brea, which is ahundant, as I know hy personal examination at the locality.) There is also a large amount of natural coke, formed hy underground fire, which I put to a practical test by using for fuel with the most satisfactory result.

There are large quantities of the crude oil of a superior quality of that from which I made samples for exhihition at the Mechanics' Institute, and for which the first premium in Septemher last was awarded to the Buena Vista Petroleum Company for hoth light and luhricating oil.

(To be Continued.)

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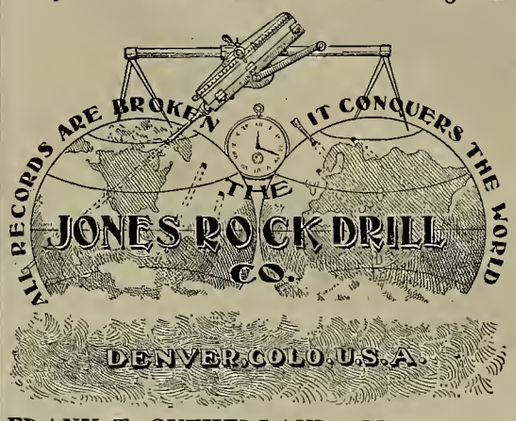

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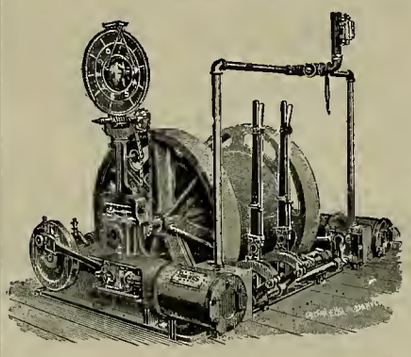

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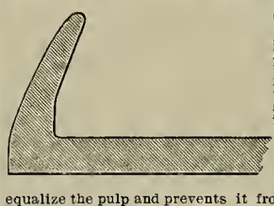

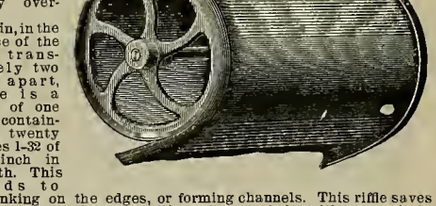

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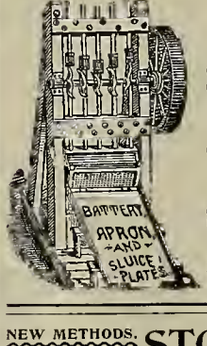

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Mechanical Progress.

Internal Rusting of Boilers.

In a recent German paper on this subject the causes of rusting are first considered, the most important being the introduction of air with the feed water. By placing the feed pipe so that the feed water enters the boiler near the low water level, and thus meets the hottest layers of water, the air is quickly exploded and passes out of the boiler with the steam, unless pockets exist in which it can accumulate. Such pockets are sure to rust rapidly, and it is recommended that they should be covered internally with a protecting paint or filled up with cement, provided they are not subjected to external heating. It is also recommended that the feeding should be complete before the withdrawal ceases for a day, in order that the water left standing in the boiler over night may be as free from air as possible. An efficient circulation is also a means of preventing rusting, as it hinders the formation of air bubbles on the shell, which, if they remain clinging to it, cause rusting. The author is of the opinion that faulty construction is more often the cause of internal rusting than unfavorable conditions of working, and summarizes the means of preventing rusting as follows:

First, while the boiler is working: (1) removing air from the feed water before it enters the boiler; (2) removing air from the water while in the boiler, and preventing its accumulation in pockets, etc.; (3) addition of chemicals to the feed water; (4) protective coatings applied to the inside of the shell. Second, while the boiler is standing idle: (1) removing all moisture from the boiler, (*a*) by blowing it off while hot, (*b*) by producing an air current through it, (*c*) by placing hygroscopic bodies inside; (2) direct protection of the shells by painting with tar, varnish, etc., by covering with protective paints and such an alkaline coating as milk of lime; (3) protecting the shells from the varying temperatures by keeping the draft in the flues constant, so as to prevent moisture alternately depositing and evaporating on the shell; (4) protecting the shell by completely filling the boiler with water from which all air has been expelled.

Of Value to Boiler Users.

A drain tap should be fixed in every branch steam pipe, as well as in every main steam pipe which is so laid as to allow water to accumulate therein.

A water-gauge tap fixed to the front of the boiler, on a level with the top of the furnace crowns, would help a boiler attendant, in case of shortness of water, to determine whether it was safe to draw the fires and turn on the feed.

A low-water safety valve would give warning in the event of shortness of water in time to prevent danger.

The feed should be delivered well behind the fire bridge.

A Promising Experiment.

In San Francisco, says the *Engineer and Contractor*, there is being constructed at present a very substantial appearing street railroad track. Ties are laid as in ordinary work, and earth and fine broken stone rammed in between until flush with their tops. The rail is a Z rail, but inclined inward in the manner of a slot rail. About every six or eight feet a bar is bolted to the rails to preserve the gauge. Upon the top of the ties and the surface formed by the rammed earth is laid five inches of concrete brought to a smooth, true curve on top, with a crown of about one inch. Upon this is laid one inch of sand, and then the paving blocks are put in. These blocks are nearly cubical and are soaked in hot coal tar. The blocks on the inside next the rail are shaped to permit the flange of the wheel to travel, and all the blocks are so laid in use there are no wide joints. The completed and viewed at a little distance has the appearance of an asphaltum pavement. The whole effect is very pleasing, and vehicles can cross the track at any angle without twisting the wheels. The road is being built by the Southern Pacific Company for a trolley line and it is understood is a trial of a new patent, the inventor being under heavy bonds for construction and repairs for some period of time. At present one block has been built on Twenty-second street, between Valencia and Mission streets.

Comparative Fuel Value of Coal, Oil and Gas.

Experiments made by the National Transit Company show the following to be the comparative fuel value of coal, oil and gas in the best practice, with boilers of proper construction and proportioned to the work:

One pound of coal will evaporate ten pounds of water at 212° atmospheric pressure.

One pound of oil will evaporate sixteen pounds of water at 212° atmospheric pressure.

One pound of natural gas will evaporate twenty pounds of water at 212° atmospheric pressure.

One pound of coal will equal 11.225 cubic feet natural gas.

Two thousand pounds (one ton) will equal 22,450 cubic feet natural gas.

One pound of oil will equal eighteen cubic feet natural gas.

One barrel (forty-two gallons) will equal 5310 cubic feet natural gas.

One thousand one hundred and twenty-five cubic feet natural gas will evaporate one pound of water.

One cubic foot natural gas will equal 860 B. H. U.

One thousand cubic feet natural gas will equal 860,000 B. H. U.

One ton of coal will equal 19,307,000 B. H. U.

One barrel of oil will equal 4,566,600 B. H. U.

In ordinary practice about twice as much fuel is required to do this amount of evaporation.

Varied Uses of Electricity.

According to the account given by a correspondent of the *Engineering Magazine*, Great Falls, Mont., appears fairly entitled to the distinction of being called the Electric City. At Black Eagle Falls, three miles above the town, an immense dam has been thrown across the Missouri, and hydraulic works and power houses erected. Not only are the street cars propelled and lighted by electricity from the power houses, but they are heated as well by electric radiators placed in each car. Elevators, printing presses, cranes and all kinds of machinery are operated by the ubiquitous force. There are automatic excavators, electric pumps and electric rock crushers. A not uncommon sight on the streets is a mortar mixer attached to an electric wire leading down from a pole. The restaurants cook by electricity, the butcher employs it to chop his sausage and hamburger, and the grocer to grind his coffee, and so likewise does the tailor to beat his goose. The subtle fluid is a welcome blessing in every home. The housewives run their sewing machines and heat their flatirons by electricity; they bake their cakes in wooden electric cake ovens that can be set away on a shelf, like pasteboard boxes. They have electric boilers and broilers and teakettles. What a singular anomaly when one pauses to think of it—that of broiling steaks and beating flatirons through the instrumentality of a waterfall!

In a paper recently read before the American Institute of Mining Engineers, L. Waldo advanced the opinion that aluminum forms a definite chemical compound with copper. If a crucible containing molten aluminum, and another containing molten copper at little more than red heat, have their contents mixed, the reaction is so intense that the metals are brought to a state of ebullition and the crucible becomes red hot. A billet of aluminum bronze shows no evidence of segregation or variation in composition from one end of it to another. The compound is A l and Cu 4. Aluminum bronze is difficult to cast, as the shrinkage is great and Mr. Waldo's firm have not yet made castings of more than two tons in weight.

To Build a Tunnel for Moving a Library.

A tunnel is to be constructed from the crypt of the Capitol under the east park to the vaults of the great building for the Congressional Library, now in course of construction. The plans for the tunnel have been completed, and work upon it will soon be begun, that it may be finished in season to be used for the transportation of the nearly 1,000,000 books and pamphlets which make up the vast bulk of the library from the old rooms to the new. It is probable that a temporary railway will be laid in the tunnel that cars may be employed to carry a large quantity of books at once.

One of the most remarkable transfers of the kind in the history of libraries was that in Berlin some years ago, when a regiment of soldiers was put to the work, received their burdens, and marched and countermarched under perfect discipline, accomplishing in a short time the vast labor of removal.

It is possible that when the new building is occupied, a pneumatic tube may be laid through the tunnel that Congressmen may immediately receive books which they desire to consult without the trouble and loss of time which would be entailed in going to the library in person or awaiting a trip by a messenger. It is not expected that the work of removal will begin before the spring of 1896.

Ten Miles Above the Earth.

The greatest height ever attained by balloonists who have returned alive to relate the story of their experience was 37,000 feet—upward of seven miles; this by Glaisher and Coxwell. They left Wolverhampton, England, at 2:30 P. M.; September 5, 1892, and during the afternoon reached the enormous altitude recorded above. Balloons have been sent to a greater height than that attained by the Glaisher-Coxwell airship, but they were not accompanied by aeronauts. In the experiments made by Hermite and Besancon at Paris they sent balloons to a height of ten miles. Each balloon was fitted with self-recording instruments. They showed that the temperature at seven and one-half miles was 60° below Fahrenheit's zero, and that the barometer marked only four inches.

Gold and Silver of the World.

According to the last report of the Director of the Mint the estimated amount of gold money in the world is $3,965,900,000, and the estimated amount of silver money $4,055,700,000. This gold and silver money is chiefly distributed as follows:

	Gold.	*Silver.*
United States	$626,600,000	$625,300,000
United Kingdom	550,000,000	112,000,000
France	825,000,000	492,200,000
Germany	825,000,000	215,000,000
Russia	455,000,000	48,000,000
Austria-Hungary	130,000,000	121,000,000
Egypt	120,000,000	15,000,000
Australia	105,000,000	7,000,000
Italy	96,000,000	30,000,000
Japan	80,000,000	88,300,000
India	.....	950,000,000
China	.....	750,000,000

At the annual meeting of the Technical Society on the 18th inst., Mr. Geo. W. Dickie, of the Union Iron Works, was elected president.

GIANT POWDER FUSE CAP FASTENER.

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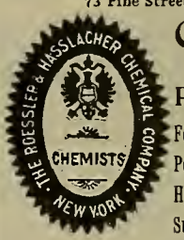

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Butte.

AROUND FORBESTOWN.—At the Gold Bank mine of W. W. Stow, the forty-stamp mill and reduction works are running constantly, as they have been for the past three or four years. From eighty to one hundred men are employed. They are running a mammoth tunnel from below the present mill site to tap the ledge far below the lowest level. This tunnel, when completed, will be 1100 feet in length, and 300 feet have been already cut. The drilling of this tunnel will occupy about two years.

It is confidently expected that the Shakespeare mill will resume full operations in a short time.

At the Denver a force of miners have just been put at work on the ledge, and the mill will soon be in full operation.

Calaveras.

WORK SUSPENDED.—*Echo:* Work has been suspended in the Bishee mine and mill on Smith's Flat for the present, pending the putting in of a new pump in the shaft. The water has increased to such an extent in the mine that a larger pump has become a necessity. As soon as the new pump is in readiness the mine will be freed from water and operations will be resumed.

GRAVEL MINING.—A cleanup was made at the Moyle claim on Balaklava Hill, south of Vallicito, last week, and according to report, the yield amounted to twelve pounds of pure gold.

A cleanup was also made at the Old Stiff claim, in the same locality, which proved highly satisfactory to its owners, Sloan & Rudorff.

Nevada.

THE RED DOG MINING CO.—*Herald:* A company has been formed to develop gravel mines at Red Dog, to be called the Red Dog Mining Company. It will be a close corporation and the owners are John Spaulding of Seigler Springs, Martin Lawrence of Auburn, W. F. Englebright of Nevada City, and J. S. Goodwin, Frank Goding and R. E. Linder of You Bet.

The company has leased all of the South Yuba Water Company's mining ground at Red Dog and vicinity, about 500 acres in all. They have a ten-year leaso.

Mr. Goding is superintendent, and has several men at work now. In the spring a long drift tunnel will be run from Missouri canyon. The new company is to be incorporated.

This ground is all rich, and years ago it paid handsomely when mined by the hydraulic process. They have to drift and ground-sluice now, which is slow work, but the gravel is rich and the new company ought to make something.

Shasta.

Democrat: At the Parsons mine in Oregon gulch the contact between the sandstone and slate was followed some three hundred feet. At present the contact dips at an angle of thirty degrees and shows the richest bed of gravel in northern California. A new shaft will be sunk on the drift three hundred feet deep, through which the gravel will be hoisted. This works a new epoch in drift mining in this county and what was supposed to be a dream has proved a reality.

NEVADA.

Washoe District.

ON THE COMSTOCK.—Dan De Quille: The Consolidated California & Virginia mine continues to look and yield well. The company have just paid a dividend amounting to $54,000, have shipped $35,690.42 to the Carson mint and have on hand at their assay office bullion to the value of $11,500. They had worked last week at the Morgan mill, on the Carson river, 710 tons of ore which averaged $50.24 a ton. They extract from the mine about 350 tons of ore a week. They have a large amount of ore in sight in the mine opened up ready for extraction.

A new drift in the Hale & Norcross mine on the 975 level shows about eighteen inches of good ore. This drift is going south, and may develop a large body of ore. The ore already assays $43.91 a ton.

During the past week the Alta mine yielded forty-five carloads of ore assaying $39.17 a ton.

The Savage last week milled 110 tons of ore that yielded $30.77 a ton.

The Chollar yielded during the past week 144 tons of ore worth $34.50 a ton.

The yield of the Crown Point was 876 tons of gold quartz, averaging $10.30 a ton.

During the past week the Justice mine yielded 120 tons of ore, which was worked at the Washoe mill and yielded $17.08, principally in gold.

Streaks of pay ore are being found to the south on the 450 level of the Potosi.

FERGUSON DISTRICT.—*Tribune:* J. P. Neshit, who for several years past has been operating in Pioche, is now at the Cullen on his way to Europe. Included in his luggage is a sack in which is contained, according to assays, proof of at least one more bonanza, the vaults of which promise good returns to all who invest. Speaking of districts last night, Mr. Nesbit stated that attention was now being largely devoted to the gold prospects and there would be a great deal of active prospecting when warm weather came. The April Fool is making a mark for itself under the lease to Frank Wilson, who is just now shipping a lot of ore to Bullionville. The Magnolia, which is being worked by Ferguson Bros. & Manning, is another promising prospect, as is also the Flagstaff, which latter Mr. Noshit is one of the owners. Referring to Captain De Lamar, the visitor says the machinery for his mill is steadily arriving, and that it will be ready for operation in March. The outlook for the country around Pioche, says Mr. Neshit, is very gratifying, and the gold production of 1895 promises to place the district far up in the list of gold producers.

SILVER STAR DISTRICT.—The Douglass mill of five stamps is running steadily on ore from the various mines. It is a custom mill and it reduces ore in fifty-ton lots at five dollars per ton. The ore is free and the process of reducing it the simplest kind. It is crushed in a battery and run over plates. There are no pans and no use for them.

The principal mines are the Hardscrabble, the New Party, the Oneida, the Direct and Mary. The ore from these mines yields from $60 to $100 at the mill. Besides these there are a dozen or more other mines that yield from $15 to $30 at the mill.

There are about eighty miners in the district, many of whom have leased mines and are making good wages.

Provisions are abundant, but prices are higher than on the railroad. Board is furnished at $1 per day. Wood is abundant, nut pine, which makes excellent fuel grows right over the mines and it sells, delivered at mines, at $5 per cord. There are five good springs of water in the vicinity, two of which are near the camp and supply the mill and the inhabitants with water.

The camp is about eight miles from Sodaville on the Carson & Colorado railroad. Ore from the Oneida mine is hauled by teams to Sodaville; thence shipped by rail to Kinkead, twelve miles, where it is worked. This mine is owned by Knapp & Co. and is considered very valuable. The vein is small but rich.

The outlook for a permanent and prosperous mining camp is good. The formation is soft and in many of the mines the ore is decomposed and resembles corn meal.

DELAMAR. — *Lode:* Wm. Perry has the contract from the DeLamar Company to haul the hullion from DeLamar to Milford, Utah. The contract calls for $40,000 per week, or $160,000 per month.

The DeLamar Company's tramway will be finished and in running order in a few days. The working of the tramway is very simple and is not an endless rope as at first supposed. There are two large cables—one and one-half inch—made fast at both ends, and will support 10,000 pounds each; the cables weigh 6000 pounds. The cars are suspended from the main cable and run on wheels. There are two smaller cables, one attached to each car. The cars work automatically, the loaded one taking the empty one back. The cars are self-dumpers. The distance between the mill and mine is 23,000 feet and the distance is to be made in eighteen seconds.

Wm. DeFreiz is chief caterer for the DeLamar Water Company, and the liquid fluid is one cent per gallon, or forty cents per barrel.

Lode: Work is being pushed rapidly at the De Lamar Co's mill. The Company's office is the finest building in the State. A greater portion of the machinery for the mill is now on the road and will be put in place as soon as it arrives. The mill is expected to be in full operation by the 15th of March. A force of about fifty men are working in and around the mill.

ARIZONA.

Journal-Miner: The Gladiator mill is pounding away with a full force of miners and mill men, paying handsomely.

At the Crowned King, one of the richest mines in Arizona, the mill is running steadily. Since greater depth has been reached on this property, water has been developed which guarantees a steady supply for the mill for the future.

On the Hassayampa, Mark Bradley and partners on the Oak mine are down 100 feet with a shaft in free gold ore that will run $100 to the ton. It is said that they recently milled twenty tons of ore and received $1800 by it. They have now seventy-five tons of ore on the dump and are only waiting for the completion of the new road to transport this shipment to Tomlinson's mill on the Hassayampa, six miles distant.

Thompson, Rowe & Co. are working "Old Often" mine steadily. This name will be recalled by all old timers, from the fact that hack in the early sixties it was worked by the arrastra process by Bill Kirkland and others, yielding over $71,000 in gold. The above miners are now running levels on the mine, and are said to be taking out very rich rock.

On the Jersey Lily they are down 185 feet. Two levels are being run in a very rich grade of ore and the mine continues to give an excellent account of itself. Seven tons of ore recently shipped to the Arizona Ore Works in Prescott yielded $252.70 per ton. It is said that for fifty-seven feet in the main shaft of this mine there is exposed as fine a looking body of ore as the mine ever had, and it is the intention now to give the property a thorough and systematic opening.

A shaft of the Congress mill broke last Saturday, causing the hanging-up of ten stamps. While nothing authoritative is given out from the above property, miners say, however, that it is yielding more of the yellow metal than ever before, and that the mine is hardly prospected as yet. Over 200 men are on the pay roll, while the town has at least 500 residents.

COLORADO.

ACCIDENTS IN MINES.—H. C. Acker, Colorado State Inspector of metalliferous mines, has made his official report to Governor Waite for the past two years. The report gives the following recapitulation of the condition of mining labor in that State: Number of mines working, 16,794; mines visited, 985; number of visits, 1,232; fatal accidents, 50; non-fatal accidents, 100; miles traveled, 34,287. On the subject of accidents and their prevention Mr. Acker says:

"Many accidents have been caused by attempts to drill out loaded holes which have failed to explode; deficient cages have caused others; tapping loaded holes with metal bars has contributed its quota to the death list, and it has happened that weak timbers were responsible for deaths because they were set by an incompetent man.

"Generally speaking mine owners have shown a commendable disposition to promptly comply with all reasonable regulations having in view the safety and protection of men in their employ. The law providing for the inspection of metalliferous mines has for its main object the protection of the lives of the most numerous class of our wage-workers engaged in what is perhaps the most hazardous of all occupations. Skilled miners know these dangers and generally do their best to avoid them, but incompetent men sometimes employed at lower wages not only endanger themselves, but often cause the loss of the lives and property of others.

"To obviate these direful results, and in view of the fact that druggists and plumbers are required by State law to fit themselves by study and experience to fulfill their duties with safety to their fellowmen, miners should be required to give some evidence of their qualifications before being employed. Corporate owners should also be compelled to see that foremen and those directly in charge of bodies of men engaged in so hazardous an employment as mining are competent to carefully care for the safety of the men under them."

He also recommends that no giant powder be stored within 100 feet of the mouth of the tunnel, and the adoption of an eight-hour law for miners.

IDAHO.

The Wallace *Miner* says: During the past month fully five hundred men have been thrown out of employment in the Cœur d'Alenes, and with exception of about one hundred men who last month got $2.10 and $2.50½ a day, all were receiving $3 or $3.50 per day. With the exception of about forty, practically all of these five hundred men, had they acted in accordance with their own wishes and those of their employers, would have been working to-day and most likely would have continued so all winter.

GREAT PLACER MINE SCHEME.—At a point on the south fork of the Payette, a short distance below its confluence with the Deadwood fork, the stream makes a great bend. At the point of nearest approach, where the river doubles back itself, its waters are separated by only 800 feet. Gulches lead up from either side, leaving a ridge about 200 feet wide and 200 feet high. The river flows a mile and three-quarters around the great bend beyond this point of nearest approach.

The bed of the stream is known to be rich in gold, different parties having taken out large sums by working along the edges at low water. There are hot springs all along the horseshoe from which gold can be scooped in considerable quantities.

This placer ground has been located by J. S. Batchen of Denver, president of the American Red Stone Company; A. Campbell of Chicago and Samuel Gillilan of Cedar Rapids, Iowa. They have admitted L. E. Farnham of Detroit to an interest and purpose to cut a channel for the river through the neck of the bend. This will leave the river bed dry for the entire distance of one and three-fourths miles, and it is believed the ground will yield enormously. It will be mined with water taken either from small streams that flow in or from the main river at the dam that will be built to divert the stream.

They have not decided whether they will make a tunnel or an open cut. If a tunnel be constructed it will be about twenty feet square. If a cut be decided upon it will, for a short distance, be 200 feet deep. The work will cost fully $25,000. It will be begun early in the spring.

Messrs. Farnham, Batchen and Gillilan are now in Boise, says the *Statesman*. Mr. Batchen has a bottle of gold which was taken out with a pan about ten days ago. It contains $108, and is the result of four and a half days' work, of four hours each, by two men, working during the warm part of the day.

NEW MEXICO.

At Cerillos the Santa Fe Placer Association are down twenty-two feet with the caisson in the bed of the Galisteo river, the last four feet being through loose rock. The caisson was recently wedged in the rock, stopping work for twenty-four hours; a pile driver was rigged, however, and they are now going ahead all right. Several satisfactory tests have been made.

The Van Smelting Company has been organized to work mines situated at Hanover, Pinos Altos, Pine Springs, and for smelting and reduction of ores at Silver City. The company has acquired control of several mines, and has a lease upon the Flaglor smelter and reduction works. It is capitalized at the modest valuation of $10,000.

The new smelting plant being erected by the American Lead and Zinc Smelting Company at Hanover is about finished.

UTAH.

SWANSEA MAY BE CLOSED. — *Tribune:* Messrs. Geddes, Snider, Brinker and Carpenter, directors of the Swansea mine, went down to Silver City on a tour of inspection Tuesday and, though everything was found to be highly satisfactory at the mine, it was partly decided to close down and cease all operations for the present. This move is made imperative by the exorbitant smelter charges, for, although there is a good ore body in sight, and last year's shipments ran ninety ounces of silver to the ton, the company cannot afford to ship ore at the present low price of silver and the heavy and burdensome working charges.

A PUMICE QUARRY.—Cleveland and Chicago capital to the amount of $500,000 takes control of the pumice stone quarry in Millard county, Utah.

The property is located five miles from Black Rock and consists of a mountain of pumice stone, covering an area of forty acres. The stone is of the purest character, such that it can be marketed and consumed for all purposes directly in its crude state.

Hitherto, every ounce of pumice stone used in the United States has been imported from some island to the south of Italy where the only known deposit in the world was said to exist. Because of its not being produced in America there has been no tariff upon it, but the Italian government levies a royalty of $5 per ton upon the entire output, so that it has never been cheaper in this country than two and a half cents per pound. Four firms in the United States import it, and have a monopoly upon it. They are Messrs. Wadell, Van Amridge, Hermann Barr and Davis. Not a pound of pumice used in America fails to pass through their hands.

To verify the rarity of pumice as a mineral deposit it is only necessary to cite the confusion that came over the local land office the other day when Mr. Quigley tried to file his papers. Both Mr. Harris and Colonel Anderson, the special interior agent, searched the statutes for a law to cover the entry, but failed to find it, so that Colonel Anderson exclaimed to Mr. Quigley:

"Well, you deserve a gold medal in having discovered something new that is not covered by the United States land or mineral law."

No pumice claim had ever been filed in the General Land Office.

Some idea of the possible market that will open up for the pumice can be obtained from the fact that one Cleveland (O.) firm has already agreed to take from 4,000 to 8,000 tons per year.

The analysis of the pumice shows as follows: Water, 4.47; silica, 71.79; alumina, 12.92; oxide of iron, 1.94; lime, 1.09; soda and potash, 8.32.

A SALT LAKE BONANZA.—*Tribune:* According to the statement of the owners, who are gentlemen whose truth and veracity has never been questioned, a ledge of gold that has assayed as high as $1800 per ton and never less than $30, with an average of $290, has been uncovered at the mouth of Little Cottonwood canyon, less than eighteen miles from the city limits of Salt Lake. It is owned through a Government patent, very recently issued, by a regularly incorporated company of prominent citizens who have known of its existence for two months, and who had been hunting for it for six months previous to its discovery. Yesterday a gang of five miners was sent out to begin regular development work.

OREGON.

MINING ON ELLIOTT CREEK.—G. W. Boggs, who recently bought the Elliott Creek mining property, has placed a force of men at work developing it. He will build a ditch about two miles in length, of the capacity of 2,000 gallons, with 250 feet pressure. He intends to run two or three six-inch giants. The water supply will be continuous and the work can be prosecuted without interruption. Mr. Boggs has had one six-inch giant in operation for the past six weeks, and the gravel shows up far better than was expected. Work will be pushed with the ditch, and it is expected it will be completed in sixty days. The property contains 450 acres, with an average depth of twenty-five feet, and the whole of it has been sufficiently prospected to justify putting in a large plant.

WASHINGTON.

AINSWORTH MINES.—The concentrator was started this week and about fifty men are employed on this and other construction. The company also has sixteen men working on the Bluebell. A large load of ore from this property has been shipped to the smelter. The company also has fifty men cutting wood for coke for the furnaces and fuel for the engines and electric light plant.

J. McVicar, has twenty-two men at work and shipped fifty-six tons to Pilot Bay.

The Black Diamond is increasing its force, and taking out a shipment of 500 tons, which will probably go to Great Falls in the spring. Jones & McLean are still driving ahead on their tunnel contract for the Canadian Pacific Mining & Milling company and the company itself is driving a tunnel in another part of the claim.

There has been considerable talk lately about organizing a miner's union here and in the Slocan country, but sentiment seems to be considerably divided and as yet nothing definite has been done.

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Coast Industrial Notes.

—The Everett, Wash., paper mill is being put in shape for a long run.

—About $5000 worth of salmon is shipped East daily from Washington State.

—Morris Bros.' Seattle foundry, recently destroyed by fire, will be rebuilt.

—The C. P. R. cement works at Vancouver, B. C., will be ready for operation Feb. 1st

—A. H. Schierholz, head draughtsman at the Risdon Iron Works, has invented an ore crushor.

—The proposition to organize a "shingle trust" in Washington State has been temporarily abandoned.

—Jas. D. Hague is reported to have bought the franchise for the electric railway between Nevada City and Grass Valley.

—The S. F. Pine Manufacturers' Association is about dead. The Pacific Pine Lumber Co. has advanced its prices 50 cents. There is a better lumber demand and a brigbter prospect for business.

—The Pacific Coast Steamship Company announces a radical reduction in passenger rates from Seattle and Tacoma to Alaskan points. First-class faro is cut from $52 to $20, and second class $30 to $10.

—Last year the New Vancouver Coal company shipped 280,018 tons; the Wellington mines 24,949 tons, and the Union mines 203,598, making a total of 741,765. The total shipments for 1893 were 718,823 tons.

—Mexican cattle sell at $5 to $12 a head, Mexican money, or $2.50 to $6 a head, American money. All the cattle a man wants may be obtained for $3 a head, American money. Sonora cattle are on the market in abundance and are liable to stay there, says the *Border Vidette*.

—The naval appropriation bill practically contains in it $5,000,000 for California. It is expected that Secretary of the Navy Herbert will award one of the $4,000,000 battleships to the Union Iron Works, besides two of the torpedo boats. The Mare Island yard is to build one of the new torpedo boats.

—Horses are as cheap in Oregon as in this State just now. A herd of 800 head, just off the range, was sold at an average price of $5 each, recently, and a few days ago, at a sale of fine stock near Portland, a splendid matched team of sorrel mares were sold for $40 and a big bay horse brought only $22.50. Half a dozen years ago such horses would have sold readily for $100 to $150 each.

—The receipts of treasure per Wells, Fargo & Co's express during the twelve months ending December 31, 1894, were $11,586,717, as follows: From the interior, $10,813,357; from the north coast, $773,360. This treasure consisted of $6,527,129 in coin, $3,005,313 in silver bullion, and $2,050,275 in gold bullion. The inland shipments from San Francisco during the year were $26,743,102, and the overland shipment $8,668,980.

—The big American ship Kenilworth from Honolulu takes the first cargo of Hawaiian sugar ever sent direct from the islands to New York. She can carry 3200 tons of sugar. The California Sugar Company conducts this new enterprise. It has arranged to ship two-thirds of the Hawaiian sugar to San Francisco, where it will be refined, and the remaining third to New York. As one-third of the Hawaiian crop is estimated at 30,000 tons, this will load ten of the largest American clipper ships.

—F. M. Hatch, Hawaiian minister of foreign affairs, who came up on the last steamer, says that the main object of his trip is to push the project for a cable between this city and Honolulu. He says the Hawaiians do not like the idea of foreign capital invested in an enterprise which they think should be purely American. Hatch says if capital cannot be secured in this country it will be sought elsewhere. The plan of the Hawaiians is to utilize Neckar island as a station when the cable is laid, with a supplementary line from Neckar to Honolulu.

—The Seattle Consolidated Street Railway Company, the successor of the Seattle Electric Railway and Power Company, operating the Second street line and its branches in Seattle, Wash., has been sued in the United States Circuit Court under foreclosure proceedings brought by the Illinois Trust and Savings Bank of Chicago, trustee, on a mortgage for $400,000, covering an issue of bonds, March 15, 1890. Default in the payment of coupons under the trust deed was made April 1, 1894, and the bank now asks that the mortgaged property, covering all the holdings of the company, be sold as an entirety and without the right of redemption, to satisfy the sum due upon the bonds.

—The Pierce County, Wash., Power and Telegraph Company have applied for permission to build and operate an electric power plant in Tacoma for manufacturing, railway and other purposes. They propose to put a dam across the Nisqually in order to get a fall of water to run the dynamos, and will put in a large amount of expensive machinery. A new company has been formed in Tacoma growing out of the purchase and combination of the Tacoma Light and Water Company with the Commercial Electric Light and Power Company. The reputed purchasers are Seymour, Barto & Co., C. B. Hurloy, and some Eastern men who make a specialty of the gas business. Mr. Hurley has become manager of the consolidated plants.

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Electrical Progress.

Revolutionizing Telegraphy.

The latest announced improvement in electric transmissiou of words is of a device which it is asserted is being uow perfected for sending messages and having them written out automatically in Roman characters as rapidly as ten operators can work under the preseut system.

The phonoscope lets the speaker at one end of the telephoue line see the person addressed at the other eud. The tautograph completes this phase of invention by transmitting a photograph over a telegraph wire and recording it as received, iu the shape of a finished engraving ready for the printing press. Akin to this is the telautograph, which records an autographic message and carries it in the handwriting of the sender; but the telegraph, first in point of time, and in a sense basal, still uses arbitrary signs or signals, which are interpreted by the receiving operator into a legible message.

Every betterment successfully attempted has been in the direction of increased speed, which has brought out the various duplex, quadruplex and multiplex systems whereby several messages cau be sent over the same wire at one time. A number of printing telegraph ideas have beeu advanced, but the speed has not kept pace with the complicatiou of the mechanism.

A description received of the uew system says:

"I wrote some sentences and handed them to the operator, who sat down before an ordinary typewriter and placed therein a piece of paper, upon which she clicked out my message. At the same time it was recorded on a ribbon of paper, through a series of holes, varying in number aud location according to the characters to be represented. Next the operator placed the ribbon above a small metal roller; above this ribbon was a series of small metallic fingers, which pressed upon it. As the different holes in the ribbon came under the fingers, electrical connection was made with the roller and a duplicate was made for preservation. The ribbon remained in place while the roller made one revolution, the metallic fingers working meanwhile as if ou a typewriter.

"Only one finger at a time was connected with the telegraph wire, but in course of each revolution every finger had a chance to send out an impulse over the wire, the holes and the fingers or keys beiug adjusted to each other throughout.

"The machine upon which the message was to be reeeived was like the one upon which it was sent. It comprised a disk with the same number of divisions iu its rim and a brush sliding against it. Iu this case each of these divisions was connected with a separate magnet, eight of them being placed in a circle, each magnet having an arm pointing toward the center of the circle, so that all of the eight arms ended within the space of a Roman letter.

"One arm made the stem to a T, or the same arm made an I, if its magnet was called upon to act. If the letter was an I, only one hole was punched in the ribbon; but if it was a T there were three holes—one for the stem, another for the left-hand portion of the crossbar and a third for the right-hand portion of the bar. In this case three of the magnets moved their small arms, which made the marks described. Above the inner ends of these levers was an inking ribbon, above which was a piece of paper, of the ordiuary letter size, and held in position in the usual typewriter fashion. The movement of the magnet arms were so fast that they made their prescribed marks upon the paper before it had time to move out of place.

"It was absolutely necessary to keep the two brushes—one at the sending end and one at the receiving end—on the same part of the disks at the same time, so that each finger might be connected with its own magnet. Yet I saw my message priuted out before my eyes, line by line, properly spaced, entirely legible and ready for delivery, although the brushes were rotating 1000 times per minute. The device by which this certainty of action is achieved is, after all, simple. Each brush arm is fastened to a shaft, which also has a disk about two feet in diameter mounted upou it. On the receiving machine at one point this disk or flywheel has two metal points near each other, but insulated, and the secondary or an induction coil includes these points. The primary of this circuit at the sending end is broken once for each revolution of a similar flywheel aud brush arm at that end, and when so broken it causes a spark to appear between the points of the receiving wheel. Now, so long as the spark seems to stand still, the two brush arms and wheels are moving at the same speed. The operator corrects any irregularity by setting his thumb against the rim of the wheel.

"My message was handed to me printed out in Roman characters, and from personal observatiou I am certain that at least 200 words per minute can be received by this system. The brush arms made 1000 revolutions per minute, and one complete letter was made for each revolution.

"Ordinary press dispatches average say five letters per word. At another time the machines were speeded up to 1500 revolutions, which gave a capacity of 300 words per minute, and all this was attained without expert skill in manipulation."

By this system the business man could dictate a message to his stenographer, who, in writing it out on the typewriter, would at the same time produce the perforated ribbon, so that the ribbon itself would be presented at the telegraph office and the message automatically forwarded.

With the best type printing telegraph systems now in use or proposed, the speed is limited to the speed of the operator, because a key is operated for each letter to be recorded, while in this system the sending speed is regulated by the number of rotations of the transmitter. If 2000 revolutions were maintained, then 2000 letters or characters would be transmitted per minute, all received on a printed page, ready for delivery.

The people who are getting ready to put this invention into use are confidently putting up their first line between Washington and Baltimore, over the same route that was traveled by Prof. Morse's trial line in 1844.

Big Electric Locomotive.

Although the electric locomotive of the Baltimore and Ohio road is to be used only for hauling trains through the Mouumental City, and not for express service, the experiment of building and using it is watched with great interest in railway circles. It is to be composed of two four-wheel trucks, and has a 300-horse power motor on each axle; and when completed it is expected to weigh ninety-five tous. While capable of making a speed of fifty miles an hour when ruuning light, it will probably run at only thirty miles with half a load, and fifteen with a full load. It is designed, however, to handle quite as heavy traius as the best steam locomotives.

One truck, which is finished, was recently tested at Schenectady. Being connected with a good-sized New York Central engine, the two were set to work, pulling against each other. The electric truck, although only half as powerful as the machine of which it is to form a part, weighed slightly more than its competitor, and therefore had a little better grip on the track. It pulled the steam locomotive up and down the road with apparent ease. This fact, among others, was clearly demonstrated: Weighted equally with a steam locomotive, the electric motor will start a heavier load from a stationary position. The pull is constant during the whole revolution of a drivingwheel in the one case, while in the other the angle which the crank makes with the line of draft causes a variation in the effective power.

The whistle of the new engine will be operated by compressed air, afforded by au air pump which also serves the air brakes. There will be a Janney coupler at each end. The current is to be supplied from a power station, and taken into the motor by an overhead trolley. The generating apparatus will be installed and the line in working order before many weeks.

New Telephone Signal.

On the first of next month the Chicago Telephone Exchange will operate a new system of signals by which a great saving of time will be effected. The subscriber will then simply take down his receiver, and instantly a little electric light with his number will flash in front of the operator. As the subscriber takes his receiver he calls the number he wishes, and the connection is made at once. At the end of the conversation the hanging up of the receiver lights another lamp which directs the operator to disconnect.

The new system is the outcome of experiments which have been goiug on for a year in this city aud Chicago. Three hundred and forty thousand persous use the telephone in Chicago. The number of calls in the twenty-four hours of each day is 115,000. Under the present system the number of calls that could be answered in an hour was 200. Under the electric signal system the number of calls that can be answered will be 600.

Continuous copper wires of the Postal Telegraph Cable Co. now admit of direct, simultaneous connection between this city and New York or Chicago, it being now possible to send a message from here to either of those cities and receive an answer in two or three minutes.

The much-talked-of electric railway from Merced to the Yosemite is assuming tangible shape, and it is manifest that the four-days round trip will be made a thing of the past. The plan involves the expenditure of a very large amount of money—nearly $2,000,000.

Electricity, of New York, is doing good work in exposing some of the frauds that have fastened on the electric business as they will fasten on any line of commercial pursuit. Just now the Electropoise and the Electrolibration Co. are receiving needed exposure.

The Western Electric Co. proposes to make matters lively for some of the new telephone companies, and has begun suit against them for alleged infringement of some of its numerous patents.

It is not so very long as time goes since incandescent lamps were $1.00 each. In '91 they were 50 cents. Competition and a free field have brought the price now down to 21 cents.

The Edison Light and Power Co. is about ready to begin its proposed outlay of a quarter of a million dollars in changing its overhead wires to the uuderground system.

An electrical horse power is the electrical power of an electrical current the product of whose volts and amperes is 746.

20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

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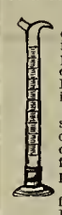

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SAN FRANCISCO.

Wire Rope Versus Electricity.

Henry Rowan doesn't agree with J. T. Fargie on the latter's paper, recently read before the Scottish Mining Institute, in which electric transmission of power for mining purposes was advocated.

According to Mr. Rowan the first cost and necessity for high-priced attendance with electric power far outbalances the asserted economy of operation, and places wire rope transmission in the lead.

According to his figures the cost of transmission from the surface to the haulage plant in the mine below was, for a particular case, very closely as follows:

FIRST COST

Rope transmission	$1,057 50
Electric transmission	5,427 50
Difference in favor of rope plant	$1,370 00

YEARLY EXPENSES.

ELECTRIC PLANT.

Interest, etc., on $5,427.50 @ 10%	$542 75
Engineer, 280 days	326 50
Motormen, 560 days	606 50
Total per annum	$1,475 75

WIRE ROPE PLANT.

Interest, etc., on $1,057.50 @ 10%	$105 75
Depreciation of ropes at 50%	228 75
Attendance, 280 days	233 33
Additional labor	82 25
Total per annum	$650 08
Difference in yearly expenses in favor of wire rope	$825 67

Black Hills Gold and Silver Product.

The amount of gold produced in the Black Hills during the year 1893 was 221,675,858 ozs., and the coinage value $4,119,083.27; silver, 137,915.20 ozs., of a coinage value of $96,540.64. Conservative and well-informed mining men, says the *Pioneer*, place the product of 1894 at: Gold, 443,351,716 ozs., coinage value $8,238,166.54; silver, 172,394 ozs., value $120,675.80.

The gold product of '93 was distributed as follows:

Homestake, Highland, Caledonia, Deadwood, Golden Reward	$3,318,237 58
Columbus	49,000 00
Colcita G. & S. Co	4,000 00
Mark Twain	3,080 00
D. & D. Smelting Co	360,000 00
R. B. Hayes	202 00
Buxton and Bonanza	39,200 00
Big Missouri	78,192 00
Hawkeye	31,000 00
Bartelow & Wilson	10,800 00
Standby	5,000 00
Keystone	42,000 00
J. R. Mining Co	85,000 00
Purchased by First National Bank	56,271 69
Other banks and jewelers	38,000 00
Total	$4,119,083 27

SILVER PRODUCT.

Homestake, etc.	$20,738 85
Burton	2,347 80
R. B. Hayes	1,453 99
D. & D. Smelter	72,000 00
Total	$96,540 64

He Knew Too Much.

The death of the late Jas. G. Fair brings to the surface a good many anecdotes of "Uncle Jimmy." The following is believed to be new:

A body of rich ore was struck in a drift, and speculative reasons made it necessary to hide the news from the public for a few days. The Senator, in his flannel shirt and oilskin hat, sat down with the resting miners in the drift; and, picking a piece of rock from a passing car, remarked:

"That's pretty good stuff; don't you think so, boys?"

There was a murmur of respectful assent from a few.

"What do you think of it, Johnson?"

Miner Johnson, who was aequainted with Fair's ways, examined the rock critically, shook his head, and said it looked barren to him. Several others did the same. Miner Murphy, a comparative tenderfoot, saw an opportunity to distinguish himself. "That rock, sir, will go all the way from $150 to $300 a ton."

"Ah," murmured the Senator, admiringly, "you're a miner, Murphy. You understand your business." Then to the superintendent in the office presently: "Brown, discharge Murphy from that drift. He knows too much."

THE ten deepest mines in Silver Bow county, Montana, are the Alice, which is down 1500 feet; the Lexington, 1500; Gagnon, 1250; East Gray Rock, 1300; High Ore, 1200; Anaconda, 1200; St. Lawrence, 1100; Mountain View, 1100; Silver Bow No. 1, 1100; and the Green Mountain, 1000.

No. 10.

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Call attention to this fac simile letter. They have others equally strong, testifying to the unqualified success of the Rielder System.

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Robt Duncan Jr Supt

OFFICE OF
ALASKA TREADWELL GOLD MINING COMPANY
Alaska Mexican Gold M'g. Co.

Douglas Island, Alaska, July 31st. 189.

William J. Chalmers Esqr.
Pres. Fraser & Chalmers.
Chicago. Ill.

Dear Sir:-

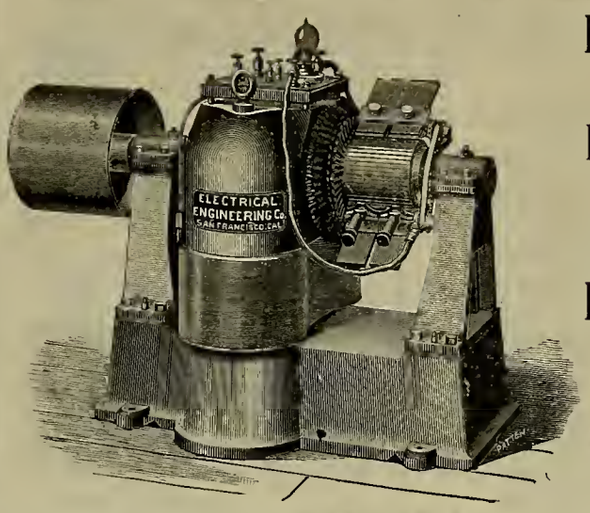
Your letter of July 7th. is duly received.

In regard to your enquiry regarding our Riedler Compressor, supplied by your Coy, over eight months ago, I must say, that the Compressor is giving excellent results, and every satisfaction, while running either by steam, or water power.

During the last twelve years, I have seen operated, and have operated, many different makes of air Compressors, including the Eclipse, Reliance, Burleigh, National, Rix, & Firth, Ingersoll Sargent, etc. etc. and in no instance, have any of the above given the results of the Riedler. Therefore, I have no hesitation in saying that the Riedler, is the best, and most economical Compressor on the market today. We have made comparitive tests here, of the Ingersol Sargent, and Riedler, which show, greatly in favour of the Riedler.

Yours very truly,

Robt. Duncan Jr.
Supt.



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A Word of Caution.

The necessity of keeping close watch over mining claims and of taking all the required legal steps to perfect title has been shown in the Coulterville district lately. In one instance a mine (patented, we believe), upon which a mill was in operation, was jumped, and several instances are reported where claims have been "appropriated." There are men who will resort to almost any means to secure desirable claims; and even though their efforts do not win, the owners are put to considerable expense. A claim is never safe until it is patented; and if a claim is worth holding, it is certainly worth patenting. It is a matter of negleet with most men that they have not secured patents, but it is liable to prove a dangerous oversight. Now that so many new men are in the county, the likelihood of trouble from this source is increased. It will prove the part of wisdom for every man who has a good mine to seeure a patent as soon as possible.—Mariposa Gazette.

THE State Gas Inspector of Indiana reports that the natural gas supply of that State will be exhausted in less than four years. He further estimates that at least $25,000,000 worth of gas has been wasted in Indiana.

THE weight of fir spars per square foot is three and one-third pounds.

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Market Reports.

The Markets.

SAN FRANCISCO, Jan. 24, 1895.

With the exception of a 2½-cent advance in lead, there was no change in the markets of the week.

New York Metal Market.

NEW YORK, Jan. 24.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.
COPPER—Brokers', 10c; exchange, 9.85c.
LEAD—Brokers', $3.02½; exchange, $3.12½.
TIN—Straits, 13.80c; plates, ——c.
SPELTER—Domestic, $3.25.

New York Prices.

NEW YORK, Jan. 24.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	27⅜	59¾	9 75	3 00
Saturday	27⅜	59⅞	9 90	3 05
Monday	27½	59⅝	....	.....
Tuesday	27⅜	59⅜	....	.....
Wednesday	27⅜	59⅝	9 85	3 02
Thursday	27½	59¾	....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	17½c
New York Telegraphic Transfer	20c
London Bankers' 60 days	$4.88¾
London Merchants	$4.86
London Sight Hankers	$4.90
Refined Silver, per ounce	59⅝
Mexican Dollars, nominal	49½@50

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	5 50
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	17	@	—
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, H and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL. SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			12 50
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	12 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, Jan. 24, 1895.

During the week, for the first time in many moons, there was a coincidence between encouraging mine reports and a strong market. An advance is noted in the leading North End stocks. The superintendents' reports, almost without exception, show improvement. In the Con. Cal. & Va. work has been resumed in the newly discovered ore which is making into the old ground. Ophir is also reported looking favorable. Last week's efforts of the shorts to depress prices were counteracted.

In the market, as in all other similar enterprises, the smaller the purse the less the chance of success. There is hut little use in sitting into the game on table stakes. The man with the shallow purse is no match on the street for the capitalist. Where there is a contest weight tells, and there is always a contest in the stock market.

The Bangkok-Cora-Bell Mining Company of Colorado paid a dividend of one cent per share, amounting to $6000, January 15th. The Forepaugh Mining Company of Colorado paid a dividend of ten cents per share, amounting to $16,000, January 10th. The Mollie Gibson Consolidated Mining Company of Colorado has declared a dividend of five cents per share, amounting to $50,000, payable January 25th.

Bullion valued at $29,200 has been sent to the Carson mint from the Con. Cal. & Va., being the final shipment for December, during which time there was produced bullion valued at $90,990.40.

The bullion statement of the Con. Cal. & Va. for December is as follows: Worked at the Morgan mill, 2124 tons. Bullion produced—Silver, $48,785.86; gold, $42,204.54; total, $90,990.40. Yield in hulliou per ton—Gold, $19.86; silver, $22.96; total, $42.82. Assay value of the ore per ton per battery samples—Gold, $20.04; silver, $30.07; total, $50.12. Assay value of the above ore per ton per railroad car samples, $50.71.

Less than 1000 shares of the Hale & Norcross were delinquent.

The following illustrates the changes of the week:

MINES.	17	24
Alpha		
Alta Consolidated	$ 33	$ 38
Andes	34	36
Belcher	48	48
Best & Belcher	90	90
Bodle	80	86
Bullion	11	
Challenge	33	32
Chollar	42	39
Confidence		
Consolidated California and Virginia	3 50	3 45
Consolidated New York		
Crown Point	60	54
Exchequer		04
Gould & Curry	34	35
Hale & Norcross	85	83
Justice	20	
Mexican	89	89
Ophir	1 70	1 70
Overman		16
Potosi	51	49
Savage	47	47
Sierra Nevada	48	46
Union	54	55
Utah	06	
Yellow Jacket	55	54

San Francisco Stock Board Sales.

SAN FRANCISCO, Jan. 24, 1895.

9:30 A. M. SESSION.

200 Andes	36	200 Mexican	89
200 Belcher	48	300	88
100 Best & Belcher	90	400 Ophir	1 65
500	88	100	1 70
300 Chollar	39	100 Overman	15
100 C. C. V	3 45	100 Potosi	49
900	3 40	100	48
100 Crown Point	53	100 Savage	47
350	54	200	46
150 Gould & Curry	35	300 Sierra Nevada	46
150	34	300 Silver Hill	05
50 Hale & Norcross	83	300 Union	55
400	82	100 Yellow Jacket	54

SECOND SESSION—2:30 P. M.

150 Alta	36	250 Mexican	84
100	35	50	85
300 Best & Belcher	85	200 Overman	15
450 Bodle	86	650 Ophir	1 55
100 Belcher	45	200 Potosi	45
200 Crown Point	50	100 Savage	43
200	49	400	42
200 Challenge	32	200 Sierra Nevada	44
600 Chollar	36	50	43
1000 Con Cal & Va	3 25	100 Union	52
100 Exchequer	04	200	53
100 Hale & Norcross	76	200 Yellow Jacket	47
650	75		

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JANUARY 15, 1895.

532,742.—SEPARATOR—H. Arden, Seattle, Wash.
532,628.—HAIR DIPPER—C. W. Babcock, Portland, Or.
532,527.—PUMP—J. P. Cahill, Oakland, Cal.
532,663.—BAND SAW MILL—D. B. Hanson, S. F.
532,461.—SURGICAL SPLINT—R. Hoppe, S. F.
532,703.—LOCK—W. G. Rex, Shelton, Wash.
532,585.—CURRENT WHEEL—Seivert & Young, Medical Lake, Wash.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Assessment Notice.

DUMBARTON LAND AND IMPROVEMENT COMPANY.—Location of principal place of business, San Francisco, California. Location of works, in the counties of Alameda and Santa Clara, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 22d day of January, 1895, an assessment (No. 7) of 12¼ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 214 Pine street, room 55, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent, and advertised for sale at puolic auction, and unless payment is made before, will be sold on THURSDAY, the 21st day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JABEZ HOWES, Secretary.

Office, Room 55, 214 Pine Street, San Francisco, California.

Roasting of Gold and Silver Ores.

BY GUIDO KUSTEL, M. E.

This rare book on the treatment of gold and silver ore without quicksilver is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe and the why and wherefore. It contains 156 pages, embracing illustrations of furnaces, supplements and working apparatus. It is a work of great merit, by an author whose reputation is unsurpassed in his specialty. Price, $3, postpaid. For sale by THE DEWEY PUBLISHING CO., 220 Market St., San Francisc.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied	Delinq't and Sale.	Secretary.
Bullion M Co, Nev	44	10c	Jan 21, Feb 26,	Mar 21	R R Grayson. 331 Pine
Bulwer Con M Co, Cal	10	5c	Dec 11, Jan 16,	Feb 15	J E Jacobus, 309 Montgomery
Confidence S M Co, Nev	25	30c	Jan 9, Feb 13,	Mar 6	A S Groth, 414 California
Crescent M Co, Cal	1	10c	Jan 15, Feb 16,	Mar 11	A K Durbrow, 309 Montgomery
Golden Eagle M Co, Nev	1	15c	Jan 3, Feb 28,	Mar 4	E B Holmes, 309 Montgomery
Gould & Curry S M Co, Nev	75	15c	Jan 17, Feb 19,	Mar 12	A K Durbrow, 309 Montgomery
Inyo Marble Co, Cal	26	10c	Jan 21, Mar 6,	April 5	W W Sargeant, Mills Building
Mexican G & S M Co, Nev	51	25c	Dec 5, Jan 8,	Jan 29	C E Elliot, 309 Montgomery
Ophir S M Co, Nevada	64	25c	Dec 10, Jan 14,	Feb 4	R B Holmes, 309 Montgomery
Potosi M Co, Nevada	43	25c	Dec 11, Jan 14,	Feb 5	C E Elliot, 309 Montgomery
Reed M & M Co, Nev	1	2c	Dec 31, Feb 11,	April 3	John H Isham, room 33, Mills Bldg.
Savage M Co, Nev	85	20c	Dec 4, Jan 7,	Jan 28	E B Holmes, 309 Montgomery
Sierra Nevada S M Co, Nev	108	25c	Dec 16, Feb 20,	Mar 11	E L Parker, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Belcher S M Co, Nev	C L Perkins, Mills Building	Jan 29
Con M & M Co	C E Elliot, 309 Montgomery	Feb 6

Assessment Notices.

GOULD & CURRY SILVER MINING COMPANY—Location of principal place of business, San Francisco, Cal.; location of works, Virginia, Storey county, Nev.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 17th day of January, 1895, an assessment (No. 75) of fifteen cents (15c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 19th day of February, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the 12th day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

REED MILL AND MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Ferguson Mining District, Helene, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 31st day of December, 1894, an assessment (No. 1) of two (2) cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 33, tenth floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 3d day of April, 1895, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

By order of the Board of Directors.

JOHN H. ISHAM, Secretary.

Office, Room 33, tenth floor, Mills Building, San Francisco, California.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia district, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 21st day of January, 1895, an assessment, (No. 44) of 10 cents per share was sold on THURSDAY, the 21st day of March, 1895, levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 21, No. 331 Pine Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of February, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office, Room 21, No. 331 Pine Street, San Francisco, California.

CRESCENT MINING COMPANY—Location of principal place of business, San Francisco, California; location of works, Mokelumne Hill, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th Day of January, 1895, an assessment (No. 1) of 10 cents (10c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of he company at Room No. 69 Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of February, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 11th day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California; location of works, Inyo, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 21st day of January, 1895, an assessment (No. 26) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 13, third floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 5th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. W. SARGEANT, Secretary.

Office—Room 13, third floor, Mills Building, San Francisco, California.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

Mining Property For Sale.

The valuable gold mining property belonging to J. F. GREGG, in the

Plymouth Mining District, in Amador County,

On the "Mother Lode," will be sold at SHERIFF'S SALE to the highest bidder to satisfy a mortgage. Sold at

PUBLIC AUCTION!

On COURT HOUSE STEPS in

Sacramento City

—ON—

February 2d, 1895.

This property contains two hundred acres of land and two large, well defined, gold bearing quartz ledges run the entire length of the property, one mile in length. There is no question about the Mother Lode running through this property. In fact, the Mother Lode at this point is very wide and this property is all "Mother Lode."

It adjoins the famous "Plymouth Consolidated Mines," operated so many years by Hayward, Hobart & Co., from which mines they took many millions of gold.

Mr. Gregg is the original owner of this property, having lived on it for upwards of forty years. He has been holding against all propositions of buyers, hoping to keep it until he could get a good price, but the financial reverses of the past two years have forced him to the wall, and the property will now be sold, in all probability, for less than its agricultural value, which he has always placed at $10,000.

Any persons who may desire to learn anything further in regard to this property would do well to address M. L. GREGG, 1203 Broadway, Oakland, C. A. HITCHCOCK, 549 Albion St., Oakland, J. H. ROUSE, 420 Ninth St., Oakland, or E. C. SUINAN, East Oakland.

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DIRECTORS—Alvinza Hayward, Jos. Knowland, Bartlett Doe, C. S. Benedict, Ed. G. Lukens (President).

Colorado Mining Stock Matters.

The mining stock transactions, both local and otherwise, chronicled during the past week have not had any tendency to improve the situation, but to the contrary matters have been seriously injured. A few more unfortunate manipulations like the one recently experienced in Mollie Gibson will soon dispel what little desire remains on the part of the public to purchase mining stocks.

The disgraceful proceedings practiced by the Pharmacist Co., of which all are unfortuuately too familiar, does not increase confidence, and has the effect of disgusting every one interested in mining stock speculation.

If matters continue to go on in what are generally considered corrupt channels, mining and everything connected with it will be looked upon with the utmost suspicion, and Exchauges will be considered licensed institutions for the protection of such questionable operations. Surely mining is already looked upon with enough suspicion without the dealings like the present being further countenanced.

I am daily in receipt of communications of condemnation throughout the East, and am assured that other brokers are being also flooded with letters of this class. Many avow they will never consider another Colorado mining investment; stated their experience in listed stocks is more disastrous than that of the unlisted, and it is utterly impossible to obtain any reliable information, which is undoubtedly true, as those interested pay more attention to manipulating or otherwise sealping the market than to furnishing customers with appreciable faets.

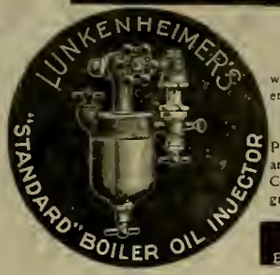
The Mollie Gibson is considered geuerally responsible for the bitter feeling now existing. Many in a position to know assert that the high-grade ore is exhausted. It is also claimed that many of the heavy holders took advantage of their prior knowledge of this faet and disposed of their holdings, thoroughly ignoring any moral obligation one is supposed to assume in prominently associating themselves with a corporation.

I do not antieipate any renewal of activity until people are placed in a position where they can understand matters more to their satisfaction and on a business basis.

This reckless buying and selling on the part of those who should endeavor to ereate confidenee, regardless of values, must cease. The market is purely professional, and has been for many weeks, and will continue to be indefinitely unless a reform of the present methods is brought about. Even dividend payers are not in good standing and are looked upon with distrust. This is not strange, considering the present outlook. The only redeeming point is that most of the properties represented by the gold stoeks are improving and intrinsieally more valuable than at any time in their history. Very respectfully, F. H. PETTINGELL.

Colorado Springs, Col., Jan. 19, '95.

BOILER OIL INJECTORS



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FOR STEAM POWER PLANTS.

The Purity Oil Filter

FOR WATER POWER PLANTS.

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A practical review of the ore deposits of this country. A valuable addition to up-to-date mining literature, of value to the Pacific coast. Sent postpaid upon receipt of price, $4.00. Address

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The work is divided into four parts: Rocks, Veins, Testing and Assaying. The geological chapters are intended to give miners a practical idea of the various formations. The chapters on mineral veins are derived from long observation, and the section on exploration has been carefully considered. All that relates to discrimination and assay has been kept as free from formulæ as possible. The work is written for practical men, and all the explanations and discriptions are clear and to the point. It is so prepared that it is useful to uneducated men as well as scientists.

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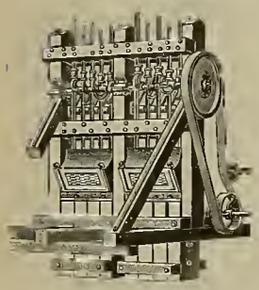

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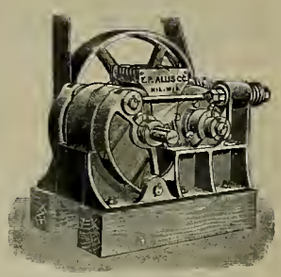

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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 5.

SAN FRANCISCO, SATURDAY, FEBRUARY 2, 1895.

THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

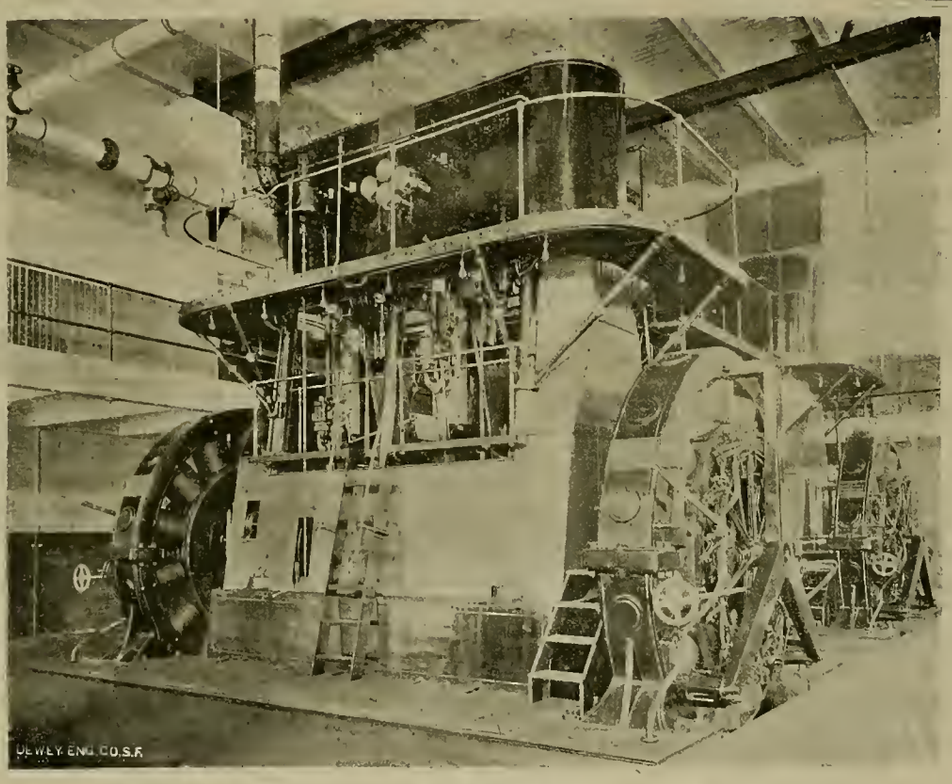
Lick Observatory Jan 1895

Edison Light and Power Co.

The accompanying illustration is of one of four similar mammoth electric generators in use in the station of the Edison Light and Power Co. on Stevenson street, this city. It is from a photograph taken by Mr. F. E. Smith, the company's chief electrician, an amateur photograper of no ordinary ability, whose daily duty and delight it is to oversee the workings of the company's huge plant.

The company is now engaged in changing its system from overhead to uuderground distribution, experience and observation showing that the latter possesses points of superiority justifying its adoption.

The principal advantages claimed for the underground as against the overhead distribution of current for light, heat and power are as follows: As all conductors are beneath the surface they cannot be interfered with by other wires, neither do they become disabled from the action of storms or burning buildings. Unlike the overhead system in which each dynamo operates its own iudividual circuit, thereby making the service dependent upon a single machine, the underground system has only one circuit, which is supplied by as many machines as the service demands, when in the event of one unit becoming disabled it is thrown out and the remaining ones carry on the work nninterruptedly. In the overhead system, when a machine becomes disabled it becomes necessary to momentarily interrupt the service while the transfer is being made.



ELECTRIC GENERATOR OF THE EDISON LIGHT AND POWER COMPANY.

All mains are connected together at street crossiugs, thereby forming a network similar to that formed by a coarse mesh wire screen, and this network supplied by feeders which furnish current to the intersections of the mains, permits of an electrical supply which would be difficult to interrupt, for the reason that if an accident should occur at one point, it would simply prevent current from flowing in at the disabled point but would not interrupt the service, as the current would still be supplied from the remaining feeding points. With the overhead system an interruption at any point on a circuit causes an interruption over the entire circuit.

The company has a splendid equipment, and is a prominent factor in the electrical progress of the city.

When a great mine has passed its usefulness as a stock scheme, it is given over to the "leasers." These men usually enrich themselves by working ground in which the great corporation could find no paying ore. The professional "leaser" is always eager to get possession of "exhausted" mines. He is the gleaner of the field after the harvesters have removed the crop, and it is often an easy matter for him to clean up a reasonable fortune from abandoned drifts and stopes.

In these days of gold finds it is worthy of note that thirty years ago some thought that the area on this coast suitable for prospecting was exhausted. Twenty years ago men said that the prospecting area was so circumscribed that in a few years there would be no new developments. Ten years ago many regions were declared "no good" that now show flattering prospects. While cheaper and improved appliances have much to do with the increased output of '94, it is manifest that suitable prospecting ground has not been exhausted and that new finds will be as plentiful in the sunrise of the twentieth as they are in the twilight of the nineteenth century.

Senator Stewart, of Nevada, may be a "friend of the people," but he effectually succeeds in disguising his feelings by promptly and continually opposing everything calculated to aid their interests. Even when the vote on the Nicaragua bill was taken last Saturday the Nevada Senator refused to vote for the measure.

Mrs. A. R. Garrison is one of the few women in California who follow the profession of mining. She has discovered some new prospects in the Panamint Range, fifty miles from Red Rock, and says she will build a ten-stamp mill as soon as the weather permits at Rasper Canyon, the name of the new mining camp.

What Recognized as Minerals.

An account appeared in last week's Press of the location of a pumice mine in Utah, and the fact was noted that the local land office officials could find no law to cover the entry when the locator tried to file his papers. The circumstance has given rise to a discussion as to what are minerals: what do the mining laws recognize as such?

In its most comprehensive sense the term "mineral" includes all inorganic substances having a definite chemical composition: so applied, all of the public lands of the United States would come under the mining act as vide the wording of Sec. 2318, Revised Statutes of the United States. But the evident meaning of the act is of course to include only such lands as contain deposits of metals and other substances giving the land a special value. Discussion occasioned the government interpretation of that matter as follows: "That whatever is recognized as a mineral by the standard authorities on the subject, where the same is found in quality and quantity to render the land sought to be patented to be more valuable on this account than for purposes of agriculture, shall be treated as coming within the purview of the Mining Act of May 10, 1872."

It goes without saying that the well known metals are included; diamond-producing land may be patented under the mining laws; borax, nitrate of soda, carbonate of soda, sulphur, alum and asphalt, also. The General Land Office has decided in entering a borax claim the proceedings shall be as in the case of placer claims. As cinnabar and copper are found in "rock in place," lands containing them must patented as lode claims. Gypsum is not a mineral be within the meaning of the Mining Act. Iron lands may be patented under that act; so, also, kaolin (porcelain clay). Limestone, marble deposits are not considered mineral lands, and such lands can be bought only under the timber and stone act of June 3, 1878. Mica, petroleum, slate and sulphur are locatable under the mining laws; likewise paint stone, oil and fire clay. Saline lands are sold under a special act of Congress of January 12, 1877, which does not apply to California. The General Land Office has decided salt as a mineral, and lands containing salt deposits have been excepted from railroad grants in Nevada. Asbestos, plumbago, manganese, etc., are held to be within the meaning of the Mining Act.

Practical mining superintendents say that in every-day use one ton of coal is equal to about one and three-fourths cords of wood.

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J. F. HALLORAN.....General Manager

San Francisco, February 2, 1895.

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THE highest and lowest land in the United States—Mt. Whitney and Death Valley—are within fifty miles of each other in San Bernardino Co., Cal.

FROM every part of the coast comes news of unprecedented snow and rainfall. While this works present discomfort and in some cases considerable loss, it insures abundant water supply for next season's mining operations.

SEVERAL other commonwealths are competing with California for the prestige of being the greatest gold-producing area. Meanwhile California's Legislature has before it a proposition to throttle the only one public institution representative of California's mines—the State Mining Bureau.

ELSEWHERE Mr. M. B. Kerr has some remarks on the U. S. Geological Survey and its self-constituted censors, who appear actuated by hostility more than justice. The whole matter indicates that the assumption of impartial criticism on the part of the Survey's enemies (through business reasons) but thinly veils the motives of the attack, and that it is less a desire for the public good than an effort to dragoon the department into a cessation of lines of work that brings that part of the public service in collision with private commercial interests. This is well understood, and discounts the force of the interested attack on that department.

THE proposition that a perverted idea of "economy" has introduced into the Legislature to close up the State Mining Bureau, is an utterly defenseless proposition. There is no "economy" about it. It looks more like a deplorable piece of petty, sectional spite work than any public measure that can be dignified by the title of State legislation. To do away with the museum's present location; to transfer it elsewhere, unless such transfer made it even more centrally located than it is now, would be to destroy its usefulness. Its good is in direct proportion to its ease of access. To turn the operations of the Bureau—its great and growing, inside and outside work—over to any other institution as an appendage, would be fatal to the Bureau's usefulness and would not save the State a dollar; rather increasing the expense while destroying its value. The Bureau is now finely officered, thoroughly organized and doing daily necessary work that otherwise must go undone, to the State's detriment. Transplanting it into different soil would be to defer if not wholly destroy any promise of further vitality. A homely adage says: "Let well enough alone." It is a good one to observe in this instance.

WASHINGTON is trying to create a State Mining Bureau. Idaho, Colorado, Montana and British Columbia are making similar effort. Those commonwealths realize what grand aid a properly conducted mining bureau can be in the development of the mining industry. This is an age of emulation, of competition, and the rule holds good in the exhibition of a State's mineral resources as in other developments of natural wealth. California has an efficient State Mining Bureau, which has done and is doing good work in the development and proper representation of that great industry. A few narrow-minded men who are at present in the Legislature at Sacramento have conceived the idea that it would be "economy" to do away with the Cal. State Mining Bureau, and virtually leave the State without such a necessary institution, and just at the time when our sister commonwealths, with clever understanding of the situation and its requirements, are severally creating State mining bureaus. The situation does not appear to require extended comment. The facts are plain to any one who cares to recognize them. It is folly to seriously entertain such a proposition as that introduced by State Senator Langford of San Joaquin. No severer injury to the State could be devised than the passage of such a bill, and we have sufficient faith in the common sense of the Legislature and its devotion to the interests of the great State its members represent, to believe that such an unwise measure will prevail.

PURELY as a matter of "economy"; in the high interests of "retrenchment" and "reform," it is proposed by legislative enactment to turn everything in connection with the State Mining Bureau over to the University of California. It is not denied (for it cannot be) that the Bureau is well managed; that it is a necessary institution of great public benefit; that there is no complaint from any part of the State, it being universally recognized that the Bureau is under intelligent and energetic direction. The matter is solely one of "economy." There is no spite work nor effort to injure the mining industry. It is just "economy," pure and undefiled. The State University, to which zealous legislative economists wish to give the Bureau, has a College of Agriculture, which, like any other public institution, is supported by public taxation. There are four professors, two "instructors," six "foremen," and so on. The salary list alone aggregates $22,760 per annum. The "experiment" department cost, last year, $14,579 more; that is an annual cost of over $37,000 in that one department of University work. This agricultural college has been in operation since 1873. In those twenty-two years it has graduated twenty-four students; of these twenty-four eight are engaged in agricultural pursuits. It may seem a little extravagant to spend over $37,000 a year public money in gradnating one-third of one college farmer every year and conducting experiment stations; indeed, people, miners for instance, who don't understand that kind of "economy," might think that this was a very extravagant way of manufacturing college farmers, and might also think that the interests of "economy" will not be subserved by turning over the mining interests of the greatest mining State in the Union to the University, where it costs $37,000 per annum to run the Agricultural College and the experiment stations, etc. True, miners and others can point to the great work being done by the Bureau; to its active intelligence in mining affairs; to the thousands of up-to-date publications it issues; the thousands of inquiries answered; the hundreds of thousands of dollars annually attracted to California for investment, and ask if it is possible that anywhere, except in the incurable ward of an insane asylum, could originate such a proposition as that now put forward by Senator Langford of San Joaquin. But those who question the financial wisdom of the proposed change don't understand "economy"; they are not up in "retrenchment" and "reform."

In the Langford, et al., dictionary, "Economy" (with a big E) may be thus defined:

Economy, noun: *œconomia* (Political). An opportunity to show how not to do it. A biennial chance to hurt the State.

No reflection is intended upon the University nor any part of its management nor the distribution of its funds. The able gentlemen in that institution of learning are above praise and beyond criticism. But now that "economy" is urged as a plea for the transfer of the Bureau it may in all humility be asked, "Where does the 'economy' come in?" It is but just to add that the PRESS understands that the University is not seeking the proposed addition, and is in no sense a party to the controversy. The issue is a plain one. In the interests of the miners, manufacturers and mining interests of California the PRESS maintains that, viewed in any light, it would be a business mistake to seriously entertain Senator Langford's proposition, and it is evident his bill is not in the interests of "economy," or "retrenchment," or "reform." Senator Langford has the floor.

The Mineral Lands.

The fight of the Cal. State Miners' Association against the absorption of the mineral lands of the State by the railroad companies continues to be pushed by the committee in charge of the work in this city. It is a matter of public concern, since whatever affects the miners of the State affects the material interests of the commonwealth. It is unfortunate that the committee is hampered in its efforts by the apathy or hostility of the Land Department officials at Washington, and the lack of necessary funds, which can only be obtained by general contribution, and concerning which an urgent request was recently published.

So far as possible the committee is overcoming the difficulties in its way, and reports favorable progress. When it was learned that the agent of the Cal. State Miners' Association was denied access to the Land Office lists of lands selected by the railroad company, a protest was at once filed with the Secretary of the Interior against such action on the part of the General Land Office Commissioner, and a request made that the Commissioner be instructed to comply with the just requirement of the Association's agent, inasmuch as the Commissioner had plainly exceeded his power. It is understood that the Secretary has acted favorably upon the protest.

During the week the House Committee has reported favorably on the amended California Mineral Land Classification bill and on the following resolution which had been introduced in the Senate and House:

Be it resolved by the Senate [or House of Representatives] of the United States, That the Secretary of the Interior be, and he is hereby, requested to suspend all action looking to the approval of selections and patenting to any railroad company of any lands selected under and by virtue of the provisions of the rules and regulations issued by the Secretary of the Interior under date of July 9th, 1894, until such time as Congress may dispose of H. R. 3476 now pending before the Senate and finally settle the question of granted lands.

H. R. 3476 applies only to Idaho and Montana. H. R. 8551 applies to this State, and effort is now making to secure a favorable report on it also. The committee to whom it was referred has favorably reported the bill, directing the Secretary of the Treasury to classify as soon as possible all unpatented lands in this State within the grants of the Union Pacific.

At present, Congress in both Houses is favorable to the protection of the mineral land to the miners; the Interior Department is indifferent, and the Land Office is hostile to their cause and in apparent league with the railroad officials who are trying to succeed in securing the lands before publicity can arouse or Congressional action prevent such acquisition. With one exception, the California Congressional delegation is doing good work for the State in this matter. Congressman Geary's actions in this regard may be susceptible of explanation, but appearances are against him.

This whole matter is of great importance to the entire State. The railroad people are rushing everything to head off defeat; they are backed up by the Land Office and have so far controlled the situation. In this there is no attempt at blame or bias; it is the simple statement of a fact. The question at issue now is, Shall the railway or the State have title to the 7,000,000 acres of unpatented mineral land in the State railroad grants?

The answer should be "the State." That was the answer of the U. S. Supreme Court last May, but since then the Land Department has changed the rules and regulations which justified such interpretation by the highest legal tribunal on earth, and so given opportunity for the present question to be raised.

The committee in charge of this matter is championing the miner in the case of the Commonwealth vs. the Corporation, and deserves public sympathy and substantial support.

Concentrates.

THE Keystone mill, Amador, is being rebuilt.

THE Utah independent smelter project has collapsed.

THE Redlands Mining Co. is running the Riley mill at Panamint, Cal.

SALT LAKE, Utah, men have bought the North Calder, Or., copper mines.

THE miners at the Mocars mine, Utah, are accepting stock in lieu of money for wages.

NEARLY $1000 is being daily taken from the Uncle Sam mine, thirty miles from Rodding.

A TEN-STAMP MILL is finished at Sterling, Nyo Co., Nev., and begins work this week.

THE American Cyanide Gold and Silver Recovery Co. is a new Denver, Col., corporation.

SEVEN Grass Valley miners have leased the Wisconsin mine from Lakeman & Co. for two years.

ROSSLAND, B. C., is the now Mecca of the miners along the northeastern Washington frontier.

THE five-foot Huatiagton mill at the Breyfogle mine, Nye Co., Nev., reports good results.

THE Diamond Hill gold mine, in St. Louis gulch, Montana, will have a new 40-stamp mill in April.

THE capacity of the concentrator at the Golden Sunlight mine, near Whitehall, Montana, is to be doubled.

THE excess of gold and silver export over import for the year 1893 was $40,407,160; for 1894 it was $110,841,277.

THE Anaconda company will begin next month the erection of a refinery, etc., at Great Falls, Montana, to cost $2,000,000.

IN '94 South Dakota produced $6,000,000 of gold, and it is reasonably expected that its gold mines will this year yield $8,000,000.

A PARTY OF POLES from Chicago are working the Original Quartz Hill in Shasta Co.; a twelve-stamp mill close by is kept busy at a profit.

THE *Journal* says that the new county proposed to be formed to include the Cripple Creek, Col., mining district, will be called Oro county.

A STRONG COMPANY has been organized to work 400 acres of placer ground near Blue Lakes in Idaho, about twenty-five miles from Shoshone.

IT is now credibly reported that the sale of the Iron Mountain mine, in Shasta Co., is a fixed fact. The price is stated to be $200,000.

THE Good Hope Mining Co. vs. David Jones case will, it is thought, be compromised. The company has a standing offer of $60,000 for the mine.

A U. S. PATENT to the O. & C. R. R. Co., embracing 227,049 acres of land in southern Oregon, was received at the Roseburg U. S. Land Office last week.

THE Klamath river correspondent of the Yreka *Journal* reports the discovery by four miners of "a great asbestos mine" opposite the mouth of Bark-House creek.

AT the office of the South Yuba Co., reports have come in that the break in the ditch which supplies many of the Grass Valley mines with water is fully repaired.

NEW MEXICO'S mineral output for 1894 has not been officially announced, but reliable data show: Gold, $1,500,000; silver, 1,250,000 ozs.; lead, $80,000; copper, $50,000.

JOHN LANG has sold a one-half interest in the Lost Horse mine, twenty-five miles from Indio, Cal., to D. Sheedy, president Globe Smelting and Refining Co., Denver.

J. AND J. H. LONOMAID, lessees of the E. & E. mines, Baker Co., Or., have leased the North Pole mine, adjoining. The E. & E. has twenty stamps and the N. P. ten.

THE Hecla Consolidated M. Co., at Glendale, Mont., has paid dividend No. 135 of one per cent, $15,000, making the total dividends up to date paid by this company $2,025,000.

THERE are 400 stamps running in Gilpin Co., Colorado. There are over 700 available. Another 100 have been recently added, one-half of which have the rapid-drop motion.

THE Shasta *Courier* says it is not unusual this season to hear of miners picking up considerable coarse gold in old diggings that have been washed over by the heavy rains.

THE Dunsmuir *News* says the snowfall at that place has been a little over twenty-seven feet, about thirty inches falling during last week. In addition there has been a rainfall of twenty-eight inches.

THE *Silver State* says the Imperial quartz mill, mill site, office and assay office at Kennedy were recently sold for taxes and purchased by H. Warren for J. R. Benton, C. E. Kennedy and W. L. Wilkinson.

FOR the year ended November 1st the Anaconda Company's smelters treated 747,500 tons of ore from the mines of Butte, Montana. This ore produced 75,915 tons of matte, of which sixty per cent was copper.

THE Old Glory, Arizona, mine has let a contract with the Joshua Hendy Works to put in forty stamps. The Griffin mills have not been satisfactory to the company and they have decided to put in stamps.

THE Mining Bureau bill in British Columbia has been amended to provide for a Provincial Mineralogist who shall take the place of the Deputy Minister of Mines. The bill is receiving lively support.

DURING 1894 West Kootenai shipped silver ore to the value of $400,000; gold, $170,000; lead, $180,000; copper, $15,000—a total of $770,000. The silver ore assayed over $100 a ton, with bar silver at sixty cents an ounce.

NEW YORK men are reported about closing for the purchase for $150,000 of the old Washington mine at French Gulch, Shasta Co. It has paid continuously for the past twenty-five years, and a ten-stamp mill is now running.

As affecting placer miners, this is Hoke Smith's latest: "There must be a discovery of mineral on each twenty acres in the placer location of 160 acres made by an association; and such a location of that amount, based upon a single discovery, is void, except as to the twenty acres immediately surrounding such discovery." A former decision covers, substantially, the same ground.

THE Stickle Company has incorporated. Principal place of business, Angels Camp, Calaveras county. Capital stock, $100,000, with the following directors: C. D. Laine, G. Stickle, E. Stickle, T. T. Lane, W. Garrare.

THE smelter at Barker, Montana, was burned down last week. It was built in 1881, and was kept in operation until silver and lead fell off in price until there was no profit, when it was closed. The origin of the fire is unknown.

THE *Record* says: A Denver company is organizing for extensive operation in the mining fields of Alaska. It is proposed to take a large number of Colorado prospectors up there and establish them at placer mining and lode hunting.

THE Canadina Pacific, or an interest friendly to the Canadian Pacific, is looking about for a smelter site. One element is pulling for Nakusp. Another element favors locating the smelter at one of the falls on Kootenay river, below Nelson.

AT the Golden Cross mine, Ogilby, San Diego Co., the forty stamps will soon give place to 100 stamps. Thirteen miles of pipe bring water from the Colorado river. The twenty-stamp mill at the Cargo Muchacho, in that district, is also kept busy.

A PRELIMINARY ASSAY on the ore of the Jeannette mine, Ainsworth, B. C., showed 78 ounces in silver and 14 per cent lead. The ore represents the entire vein, which is five feet wide from wall to wall. It will concentrate about five tons into one.

PAPERS published in mining counties of Idaho are giving hearty support to the proposition to amend the mining laws of the State in such a manner that locators will be required to show their good faith by doing ten feet of work within a reasonable time after location.

THE Sierra Buttes Mining Company, which recently bought the Mammoth mine at Jacksonville, Tuolumne county, for $80,000, is developing the property. A crosscut recently made discovered a rich parallel vein, the existence of which was not suspected by the former owners.

THE North Fork drift gravel mine, in Sierra county, is reported doing well. The tunnel is now in over 700 feet, and is being driven at the rate of two sets a day. Fourteen men are employed, and they are making good headway, and expect to reach the old Uncle Sam incline by next August.

THE Morning Glory mill, Turkey Creek, Arizona, is dropping stamps regularly, the plant being run by the men who have been in the employ of that company, and having a business difference with the proprietors. They are said to be making money and that the mine is good property.

THE latest candidate for mining favor in the treatment of refractory ores is the Brind-Nicholas process, which will be operated in the United States by the Brind Extraction Company. It is already working in Australia, a 100-ton plant now being in operation in one of the mining districts of Victoria.

THE Rosemont, Ariz., copper mines have closed down. Very little development work has been done on the property, and it was found to be a piece of folly to try to maintain an eighty-ton smelter running on surface ore. This is but another instance of the uselessness of erecting reduction works before having a mine.

THERE are three giants running night and day within three miles of Grants Pass, Or. Two of them belong to Wickstrom & Corliss in the Dry Diggings and the other to Spencer & Gunning on Bloody Run. Several acres will be torn up and sent into Rogue river before the water gives out, and the indications point to a profitable cleanup.

THE patent issued the Montana Mining and Reduction Company on mineral entry for lands in the Helena, Mont., land district, involving the Ida, Emma, Cleveland, Dandy, Bismarck, Star, Saratoga and Handy Lode claims, has been cancelled by the Interior Department. It is charged the lands were non-mineral and the entry was fraudulent.

THE Kootenai Hydraulic Placer Mining Company, which has been operating all the way along the Pend d'Oreille river from Boundary City to the mouth of the Salmon river, has turned its affairs over to the Kootenai Water Supply Company, which will take charge of all the placer mining operations of the former company and work them on a royalty.

L. THUILLIER of Lewiston, Idaho, is operating at the mouth of Alpowai creek a machine which he says will save nearly all the fine gold that exists in the sand along the Snake and Clearwater rivers. He claims that "while a rocker will not pay over 35 cents per day, this new and comparatively simple device pays from $3 to $5 per day, according to the ground."

THE Debris Commission have granted hydraulic mining permits to Robert, James and John Blair, proprietors of the Mitchell hydraulic mine; El Dorado Water and Deep Gravel Mining Company, proprietors of the Henrietta mine; Rollaud & Vanderberg, proprietors of the Epley mine; and Hancock & Daly, proprietors of the Last Chance mine. All of these mines are located near Placerville, El Dorado county.

A BILL has been presented in the Washingtou Legislature to create a Mining Bureau, to consist of three commissioners, representing the different mining sections, their duties being to gather all the information of the mineral interests of the State. Repositories are to be established at Seattle and Spokane, where ores may be left and maps, drawings and copies of assays placed on file.

THE Mammoth mine, near Middle Bar, Amador Co., is reported sold to an English company for $30,000. Several kidneys of black metal carrying a heavy percentage of gold were formerly taken out, aggregating in value nearly $100,000. Two shafts were sunk—one to a depth of 800 feet—and a tunnel driven from a point fronting the Mokelumne river to tap the latter, wherein work has been done for short periods since regular work was suspended.

AT the recent banquet of the American Assocation of Mining Engineers at Bridgeport, Conn., W. D. Bishop created considerable amusement by reading a prospectus of "The Woodland Gold Mining Company" of 4894. The prospectus recites that the company has discovered and purchased the precise spot where were buried the wealthy New Yorkers of the olden time. It says that it has been calculated that the remains of no less than 9,500,000 people were buried on the ground that the company controlled, and that as at the time, in the nineteenth and twentieth centuries, when they were buried, it was the fashion to fill the teeth of the people with gold to an average amount of $7.50 to each person, no less than $71,250,000 worth of gold was buried in the territory, which would be recovered at a small expense. The company expected to make a net profit of at least $40,000,000 on a small outlay.

LEONARD SAWYER, of Buffalo, N. Y., has bonded the Palmetto, Arizona, group of mines for $90,000 for six months. They are in the Pinnosa mountains, on the old Ehrenburg road, and are known as the cement deposits, being covered by placer locations, and comprise in number six claims. They had been known for several years, on account of their richness and the peculiar geological conditions attached to them. The claims have been thoroughly and systematically prospected, and in every test made the same uniform results have been given in free gold.

LIVELY times are prophesied at Coulterville, Mariposa county, next season. Large quantities of machinery are being received and put in place. While there is no demand for any more laborers, there being a good supply in the vicinity, it is expected by April or May next several hundred men will be needed to carry on operations already planned out. Coulterville will soon begin to put on the appearance that the town had in the old days of California mining when twenty-dollar pieces were as plentiful as dollars are now and were more evenly divided.

A NUGGET, not gold, but representing a chunk of that metal, and worth, if pure, $25 or $30, was recently swapped to a Hassayampa, Arizona, man for a horse. A Prescott assayer made an acid test of the metal and pronounced it oroide, or a composition of base material. The acid bit at the touch and copper colors were instantaneous, but strangely enough the metal resumed its golden hue as soon as the acid had been wiped off. It had the appearance of having been smelted in a forge; even the ray marks in which the amalgam had been wrapped were apparent. It was this characteristic that fooled the Hassayamper.

IT has always been supposed that the Sterling Mining Company, in Josephine Co., Oregon, owned all the mining ground along the creek for a distance of three miles and more, and that this ground was covered by their numerous purchases. It develops, however, that this is not the case, and that the company only owns a narrow strip along the creek, and that this strip does not cover the old or back channel, but a part of the distance, and that a large amount of the rich mining ground was vacant. Some parties in searching the records discovered this fact and located the vacant ground—some four hundred acres.

THE millmen of the Horn Silver, Utah, concentrator are reported suffering from a new complaint caused by the use of the water in the mills. The water is used over several times and becomes strongly impregnated with arsenic, antimony and other like poisons, and as the men are required to occasionally immerse their hands in this, it seems to penetrate the skin and produce sores similar to felons. When they go to the hospital to receive treatment these men are told that the sores are produced by poisons and are not felons. Like lead poisoning, it is a natural consequence of the handling of this class of ores.

A. R. HAMMOND, who headed a party of sixty miners and assayers to South Africa last May, writes from Buluwayo the reverse of encouragingly. Fevers, tigers, hostile Zulus, lions, desolate country, etc., interfered considerably with the success of the expedition, according to a letter to the *Chronicle*. He concludes by saying: "The Californians of my expedition have so far located 220 mines, and have placed on the London market 125 square miles of good land in conjunction with the other properties. Messrs. Bumohom of Pasadena and Ingram of San Francisco will leave for London to see Cecil Rhodes for the purpose of forming an expedition to open up the country on the headwaters of the Zambesi during the coming year."

THE Assembly Committee on Mines and Mining has before it two bills for consideration. The first, introduced by representative Holland as Assembly Bill No. 90, provides that all cages, buckets, skips and other apparatus used in mines shall be provided with a safety. This applies to mines where the shafts are deeper than 300 feet and where twelve or more men are employed. In addition, the mining company must sink another shaft or construct another tunnel to connect with the main working shaft of such mines as a means of escape from underground accident. Failure to comply with provisions of the law will render the individuals or corporations liable jointly and severally for all damages to miners or their heirs. Tibbits' Assembly Bill No. 294 adds a new title to Part 2, Division 2d, of the Civil Code, providing that supervisors may divide their county into mining districts or establish such mining districts therein as they shall deem necessary.

Personal.

JOHN VASS is the new superintendent of the White Swan M. & M. Co., Baker Co., Or.

CHIEF ENGINEER JOSEPH TRILLEY, U. S. N., has been ordered to the Olympia and will for the next year direct the operation of her machinery.

F. E. BRIGHTON has succeeded G. V. Gray as superintendent of the Gladstone mine, near French Gulch. The Cleveland, O., men who own the property have spent about $250,000 in developing the property.

J. J. BYRNE has been appointed general passenger agent of the Atlantic & Pacific and Southern California, with headquarters at Los Angeles, to take effect Feb. 1. The office of assistant passenger traffic manager of the A. T. & S. F. is abolished.

Obituary.

NAVAL CONSTRUCTOR ARMISTEAD, who was injured by the hawser parting while removing the case on the caisson from its position at the drydock at Mare Island on the afternoon of the 26th, died at the Naval Hospital at seven o'clock the next morning.

WM. IRELAN, SR., a California pioneer, died in this city on the 27th ult., in his 84th year. He founded the first shipping yards in this city. Shortly after the wreck of the Golden Gate on the Manzanilla coast, in '62, he recovered $800,000 of the million and a half on that ill-fated steamer, of which his share was $250,000. He engaged in mining in Sierra and Placer counties, and did considerable toward developing mines there and elsewhere in the State.

The U. S. Geological Survey.

To the Editor:—The watchword of our present generation is "fair play." The football enthusiast grows vehement in denouncing an unfair decision, and a great nation often stands quietly overlooking with war ships inferior nations engaged in strife, and proclaims "neutrality," or, putting it more strongly and more commonplace, prevents one from taking undue advantage of the other.

The writer, as a subscriber to the *Engineering and Mining Journal*, has noticed in the two last issues many remarks upon the work of the U. S. Geological Survey.

While feeling perfectly friendly toward the *Journal*, I cannot but feel that the Survey is not receiviug "fair play" in the receut criticisms. Having also served eight years in the topographical corps of the Survey, a few remarks are now presented, which cannot be said to be influeuced by personal feeliug or any possibility of preferment by the departmeut, as I am now busied in the private practice of mining engineering in San Francisco.

Referring first to the letter of Dr. Persifor Frazer in the *Journal* of January 5th, one caunot but be struck by the lack of iutimate knowledge displayed by him of the work of the Government surveys. Dr. Frazer says "that a geological survey should be purely scientific and only incidentally economic, and should not try to make topographic maps or compete with the older or more valuable institution whose work of this kind contrasts favorably with any heretofore accomplished in the world."

If Dr. Frazer will kiudly state how it is possible to make a *geological map* without first having delineated a *topographical map*, such information will be welcome to those interested in scientific research, and he should also mentiou what institutions outside of the Geological Survey (which was formed in 1878 by combining the Powell, Hayden and Wheeler surveys) aud the various State surveys have made topographical surveys. If the U. S. Coast and Geodetic Survey is meant, the public well know that the minute aud correct work of this Bureau is confined to the immediate vicinity of the Atlantic, Pacific and Gulf coasts to aid the mariner in navigating harbors and elsewhere for coast defenses. The "Coast Survey" in the interior is simply a "geodetic survey" to counect ocean with oceau by triangulation.

The investigation of irrigation questions and ganging of streams is only a small matter to wind up the irrigation inquiries begun some years ago by the Geological Survey.

Director Walcott has himself answered the question whether "euginеers, chemists, etc., of the Survey receive fees while drawing Government salaries" by a decided "No," and so has his predeeessor, Major Powell.

There thus remains to be discussed the question, "Should it be a bureau of research and report upon questions of mining, metallurgy and statistics?"

For many years past the Survey has made detailed and valuable maps and reports of special mining areas and published annually a report upon the "Mineral Industry of the United States." This work, under the direction of Dr. David T. Day, has given general satisfactiou, the only criticism being that the Government printing office has been so crowded as to prevent these volumes from being issued promptly at the close of each year.

The *Engineering and Mining Journal* has also published for two years past the "Mineral Industry and Statistics of the World"—a very valuable work, but, having such a wide field, it cannot be, in that portion referring to the United States, as detailed or accurate as the work uudertaken by the Geological Survey, which makes special report of each mineral product and gives further information of benefit to the mining operator in this country.

There is no doubt but that the work of the Survey could be incorporated each year in the book published by the *Journal*, which latter in its present conditiou must necessarily be somewhat approximate.

The *Engineering and Mining Journal* of January 12th contains a letter from Mr. John F. Blandy, of Arizona, which, upon reading, appears more serious. The only answer to this criticism is that it is well known that some of the topographic work credited to the Geological Survey has been compiled from other surveys, with a desire to prevent duplication and economize time and money. And again, some of the work done in the earlier years of the Survey has been drawn on too small a scale for detailed geological investigatiou, and will have to be done over again. This refers particularly to Utah, Nevada and Arizona.

Another criticism brought out by Mr. Blaudy is that the U. S. Geological Survey is gradually crowding out the State Surveys. In Massachusetts aud New York both States joined forces and paid half expenses to make a topographic aud geological map, the field work performed by the well trained corps of the Geological Survey, and the management under a commission of State and Government officers. Why eannot the same plan be followed by the other States to the advautage of correct and economical work?

There is no doubt but that the work of the Geological Survey is open to criticism, but to an interested observer the maiu object should be to give all the practical information possible—not to publish such senseless and bitter criticisms, but to preveut the Survey from becoming too technical.

Government maps should all be drawn to oue scale, and special maps made on large scales only in mining regions and other points where detailed geologic investigation is necessary.

The Land Office publishes township maps on a scale of two miles to one inch, and, in view of the large amount of country yet to be mapped by the Government, this general scale is adequate. The topographical maps should have township corners placed upon them, so that the practical civil and mining engineer can locate himself in a more direct and recognizable manner than by polyconic projection.

If the *Engineering and Mining Journal* desires to be a frieud to its clients, why should these childish quibbles and criticisms be published? Rather let the *Journal* advocate *centralization*. The differeut surveys, the U. S. Coast and Geodetic Survey, the Topographical and Geological Survey, and mining statistics and the Land Office Survey, should all be placed under one jurisdiction, and this "Burcau of Surveys" could pass judgment on all the work heretofore performed and see that future work is drawn to one adopted scale. Each separate branch could theu pursue its course without duplication or iuterference, aud, all having "fair play," a result would be accomplished redounding to the credit of accurate and economic work. Mark B. Kerr.

San Francisco, Jan. 25, 1895.

From Placer County.

To the Editor:—Perhaps there are but few spots iu California to-day that have become less attractive and almost dropped completely from the memory of the early gold hunters, and so little known of to the preseut popnlation, as this aud similar localities situated iu the foothills and the Sierra Nevada mountains themselves. Every facility is here offered to the practical and economical miner to push the work with advantage at all seasons of the year, under the most favorable circumstances, for which he will be liberally rewarded in amounts to warrant him, or them, to continue the work. Very little developing in a practical way, outside of scraping over the surface, has been done. The "old timers," or pioneer gold hunters, what few there are still alive in these localities, have but one idea, together with their early acquired habits of the use of liquors and extravagant way of living and taking things in a slow and easy-going way. They are looking for and trusting in the future for a revival of the early days of excitement and hilarious living, but do nothing towards helping to develop the mines to correspond with the present epoch. They delight in congregating at the grocery, where cheap liquors and tobacco are dealt out, sometimes on tick, in a large back room, warmed up and provided with cards, etc., and recite to strangers what they used to do, etc. The younger men hereabouts easily fall into the old worn path and become in time the same as their predeeessors. It is a repetition of history, less the gold excitement. Nothing is done to get ahead of actual wants in a rude cabin with one room for all purposes. It is deplorable in the extreme, and something ought to be doue to change the methods and systems of such non-progressive people. Our newly elected member of Congress, Grove L. Johnstou, who was such a bitter enemy to hydraulic miuing in the anti-debris times, has promised to obtain relief iu way of appropriations for restraining dams, but delays cast gloom over the prospects. However, we anticipate the best results through his promulgations at Washington for the benefit of the mining community.

Why go to South Africa and Australia gold hunting when such spleudid opportunities are here offered under California's genial climate and its protective laws? Those apparently new gold fields have already put on the dyiug garb, aud word comes that it is overdone and overrun. The writer put in several years iu the Andes in South America, but under less favorable circumstances, conditious and climate than our own Califoruia offers. Let us with one accord believe in and push the mining interest of California to renewed activity.

Aside from the very promising miuing outlook in this locality, it is one of the most picturesque sections of our State, abounding in pure water, air and other life-giving elements. A more beautiful place for a tourist's hotel seldom eau be found with such advantages and attractive scenery. It far surpasses other resorts of noted reputation for summer visitors for health and pleasure. I've seen them all. Yours, etc. Traveler.

McKinstry Ranch, Placer Co., Cal., Jan. 26, '95.

Astronomers claim that there are over 17,500,000 eomets in the solar system alone.

Reporting on Mines.

To the Editor:—Two reports are called for: one elaborate and in detail, that is to be printed with views interleaved aud is intended for the eastern aud foreign market; the other concise and emphatic, for the experienced mining operator. A miuer onee requested me to show an elaborate report, by a celebrated expert, to a large operator. The operator waded through the report, until he got fairly into the geology, when he handed the report back to me with— "D—— such rot! If the gold is in the vein all the rocks this side of Hades won't take it out, and if it aiu't there they wou't put it in! Tell him to sample his vein, measure the width and length of the ore shoot, and report; and tell him to frame this report or use it to start his fires with."

The professional expert may claim that if the average miner were to report on his mine, he, like the haugman, would be his owu "neckspert." However, the practieal, experienced miner, owning a prospect, can give a description as satisfactory to the California miuing operator as the expert, if he will be honest with himself, and not, from force of habit, involuntarily select, in sampling, only the rock from the richest portion of his vein.

The average buyer requires the location of the mine, its situation as to roads and water power, the title, character of the ore: i. e., free milling or otherwise, average width of the veiu, length of the shoot with sketch showing development, average sample of the vein, a fair-sized piece of the mineralized portion of the veiu, and, last but not least, reasonable price aud terms.

Many of the reports issued remind one of the old attorney's advice to the young lawyer: "If the facts are in your favor bring them out and stay by them; if they are against you avoid aud talk all around them." If the mine is a good property, a few facts, plainly stated, will suffice; if it is not "in sight" a great amount of sophistry will be required to conceal it. California miue operators buy either on their own judgmeut or that of some one in their own employ, and only want the main facts to determiue whether they will investigate or not. Once they see a mine what they have previously read has no effect on the samples they secure aud on the value of which they buy or decline. Respectfully,

E. H. Schaeffle,

Murphys, Cal., Jan. 19, 1894. Ex. U. S. M. E.

In the Jicarillas.

To the Editor:—The mining camp of the Jicarillas, located in Lincolu county, New Mexico, is attracting the attention of miniug men on account of the formation here, which is so strictly of a volcanic nature as to prove beyoud a doubt that the formation of the ore bodies of the district was from the heat and eruptions of numerous volcanoes, the chimneys of which can yet be traced on the ground.

Unlike most miuing districts, the district of the Jicarillas is not one in which the leads, generally speaking, are of value. True, many are the locations on small veins of high grade ore, yet invariably do they find on sinking that the ore pinches out, aud they lose the treud of the vein, only to be confronted by country rock on all sides.

The properties which cause the most talk among mining men are located in what is called in the district "iron blowouts." These blowouts are chimneys of ore coming from the bowels of the earth, and for 150 feet or more on the surface they are choked up by volcanic ashes and debris of different kinds, showing that the ore at one time was exposed, but that it either settled or else the ore in coming out failed to reach the surface aud as a consequence the opening thus left was filled up with foreign matter.

From the above it will readily be seen that the camp of the Jicarillas is no camp for the poor man, for the ore lyiug so deep makes it impossible for a man to open up a mine unless backed by money, and lots of it.

Geo. J. Weishar is the owner of two claims, which show up some good metal in the walls near the surface, but there is no ore body in sight, and it will take several feet of developing work to open up any pay on the properties, both of which are on blowouts.

Jno. Duncan is locator of the Silver Cup, a claim which ten feet from the surface assays $10 in gold and holds promise of leadiug to a large ore body.

Harry Comrey, W. W. Fitzpatric, E. L. Ganne and several others own claims which are now lyiug idle on acconnt of the lack of capital to develop them.

P. C. Bell, owuer of the Elizabeth, is the only miner in camp who is developing his claim and putting in any great amount of money. He states that there will be a mill on the claim in the very uear future. "Jics."

Sixty per cent of the coal used in making gas in Chili comes from Australia. Englaud furnishes a little cannel coal and the remainder is from native lignite mines.

The Removal of Clay from Iron Ores.

Clay or adhesive earthy substances prove about the most difficult matters to deal with in regard to iron ores, for while moisture and insolubles are largely increased, thus reducing the metallic content of the ore as received at the furnaces, the difficulty of removing adhesive matters is considerable, particularly when it is inclined to form slimy balls when moved. Some clays disintegrate easier than others, while some become almost glutinous when wetted, and as they are always more or less moist when raised, they cannot be dealt with in a dry state, however desirable a dry process would be. Friable or sandy clays are easily dealt with, as they disintegrate readily in an ordinary revolving washing cylinder having internal blades, as in the case of a clay-washing mill; but if the grains of ore are much larger than eggs, this cannot well be done owing to the continual stoppages, and to the repairs which become necessary through the knocking about of the ore grains. Where the grains are large, it becomes necessary to use a nearly horizontal cylinder of considerable length, spikes projecting from the sides to prevent the wet material forming a ball, by checking the regular rolling of a large mass. A regular flow of water must pass through the cylinder to remove the fine matters as they become separated, and the larger parts will travel out of the cylinder in the ordinary way adopted to these apparatus. It is not readily possible to crush the large grains before washing, as the crusher would probably ball the clay in such a way that subsequent washings will fail to cause disintegration. So far as possible, the men engaged in mining this class of ore should separate the larger grains of metal from the bulk, and this they will usually do if an increase of a few pence per ton is given for large clean grains for loading.

Ore which is full of tenacious clay readily separable in water, but which requires some amount of soaking, can, if water is plentiful, be well and cheaply cleansed by turning a jet of water on it and washing the face of a heap, the water and clay in suspension being carried away in troughs, while thecleaned ore is loaded up for further separation in jigs or into wagons for sending away to the furnaces, as the case may be. By carefully laying out a floor for this work, and by having a moderate head of water, large bulks of clayey ore can be treated very cheaply in this way, while if there is only a small quantity of fine sandy ore, the loss in metallic value will not be great. Special washing troughs of perforated steel plates might also be used if preferred, and in these the ore might be readily prepared for market, as only that which was perfectly cleaned need be left in the troughs, the water and dissolved clay passing through the plates.

Very tenacious clays are best washed out with a more or less powerful jet of water, and in this case the troughs just described are very useful indeed, as they permit of the removal of the clay at once. The cost is more in this case than with more friable material, but conditionally on the ore being placed in the troughs, or in a bin communicating with the troughs, say, in one-ton lots, the water thoroughly removes the clay before another lot is shot in the washing receptacle.

Gold Mining in the Transvaal.

During the second quarter of 1894, 823,1"0 tons were milled by 2922 stamps on all the gold fields of the South African Republic, the average number of days on which milling took place being 78. Witwatersrandt, not including the Nigel district, represented 725,394 of this total tonnage. During the same period 882,937 tons were raised. The average number of tons crushed per stamp per diem was 3613, being highest at Klerksdorp, 4659 tons, and lowest at De Kaap, 1971 tons. The gold produced by ordinary milling operations totalled, during the same period, 369,905 ozs., worth $6,653,545, the yield per ton being on all the fields 0.449 ozs., and the value $8.08. Out of the above total Witwatersrandt represents 327,291 ozs. During the same period 759,828 tons of tailings were worked, of an average assay value of 0.270 oz. per ton. They were the richest at Heidelberg, 1.217 ozs. per ton, and the poorest at Klerksdorp, 0.223 oz. per ton. From them were produced 173,766 ozs. of gold, or 0.229 oz. per ton treated, showing 0.041 oz. left in the residues treated. The value of these was 516,577, or $3.38 per ton; 5735 tons of concentrates were produced and 4652 worked. The average assay value of the untreated ores was 8.348 ozs., and of those operated upon 3.912 ozs. per ton. The De Kaaps were the richest, 7.741 ozs. per ton, those of the Witwatersrandt averaging 3.318 ozs. The total output from concentrates was 18,632 ozs., worth $353,675. The total gold production of the State from April 1 to June 30, 1894, was 563,222 ozs., of a monetary value of $9,605,840.

SCENE ON THE RAILWAY IN THE CALIFORNIA MOUNTAINS.

A MOUNTAIN GORGE IN ITS SNOW MANTLE.

THE cash value of a locomotive averages $10,000, and there are now in use on the railroads of the United States about 35,000 locomotives, representing a total investment of $350,000,000. The Pennsylvania railroad stands at the head of the list with 1625 locomotives. The New York Central is not very far behind with 1200 locomotives.

THE use of the telephone on Australian sheep ranches is becoming common. Its employment is mentioned on the Clark ranch in Montana, where all the sheep and shepherds are watched and handled telephonically by means of six stations, all communicating with a central point.

On the California Mountains.

Herewith is illustrated one of California's resources which is not usually counted among the possessions of the State, and that is the exceptionally fine snow mantle of our mountains. It is an exceedingly picturesque feature of the State, but one which is as little appreciated as it is talked about. It is only when it asserts itself, as it is now doing, in the stoppage of overland traffic, that the public generally notes its presence. It has not yet caused us the inconvenience of earlier years, when days multiplied into weeks before the trains could break through the mountain blockade, but that is no fault of the snow. It is all up there ready for the blockade business, but the machinery for its conquering is much superior to that of former days.

The engravings are characteristic mountain scenes this month. One shows a site on the overland line where the snow has well nigh buried the small village, while the railway runs between banks twenty or thirty feet high made by the powerful rotary plow in keeping the rails uncovered. The man standing in pensive mood on the railway track is not waiting for the train. He is merely thinking what a fool a photographer must be to prowl around in such weather.

The other scene shows the unbroken solitude of the snow-clad mountain region away from settlements and railway lines. The gorge is well nigh choked with snow, and the tall pines, which in the distance seem like the trees of the toy shops, are in many cases half buried. It is a scene comfortable to contemplate when one has his feet on a warm fender.

The Truckee *Republican* says: "Truckee presents an appearance that is at once novel and picturesque. To the average Californian who is accustomed to seeing green fields and blooming flowers, it is a marvel. The whole town is enwrapped in the emblem of purity to the depth of several feet, while icicles in their crystal splendor adorn the eaves of every house. The rotary snow plow, as it drives up and down the track throwing a stream of snow a distance of a hundred feet or more, is a sight that would interest the most stoic observer. In order to cross a street in Truckee, one must climb from the sidewalk on steps in the snow to the street and then descend on the opposite side. People on one side of the street cannot see those on the other side. In many places the snow is so deep around the eaves of the houses that it has to be shoveled away from in front of the windows in order to allow light to enter the house."

IN some recent experiments, says A. C. Swinton, Mr. J. C. M. Stanton and I found that, employing a very strong electromagnet, a piece of ordinary white asbestos mill-board, about $4x3x\frac{1}{16}$ inches in size, and weighing one-half ounce, was easily lifted through a vertical distance of one and one-half inches, and when in contact with the magnet pole the asbestos pole would support four ounces in addition to its own weight. Lumps of hard asbestos, such as are used in gas fires, as also pieces of soft asbestos cotton packing, were also strongly attracted, and when some of the latter was placed on the magnet pole and the current turned on and off, the individual fibers could be seen in movement. Further, it is quite easy to permanently magnetize a piece of asbestos mill-board, when it will behave exactly as a magnet both in attracting and repelling a compass needle. The principal constituents of asbestos are stated to be magnesia, silica and alumina, with some oxide of iron. No doubt it is to the presence of the last-named substance that the magnetic qualities are due. White asbestos is, however, understood to contain but small traces of iron—much less than the colored varieties—and consequently the degree to which it is magnetic seems surprising. In any case, it may be well to warn experimentalists that asbestos is not a suitable substance to employ in connection with delicate instruments where any unsuspected permanent magnetism might be productive of serious error

Some Practical Results.

TO THE EDITOR:—I have read with much interest the articles on the "Limitations of the Stamp Mill," and believing that some results obtained by me in working in the line indicated by Mr. Phillip Argall in his discussion of Mr. T. A. Rickards' paper would interest some of your readers, I submit the following:

The value of the ores here is almost entirely in the sulphides—iron, zinc, copper and lead; hence the end sought in designing a plant was to crush sufficiently to clean the quartz and avoid slimes as far as practicable. The fact that the concentrates were to be treated by chlorination was also considered. For a crusher a Tustiu pulverizer is used, and a McGlew concentrator handles the pulp.

About fifty tons were crushed and concentrated, with no plates for catching free gold. A number of tests of pulp and tailings were made from time to time, the samples being taken with care. The results invariably showed ninety to niuety-four per cent saved in the concentrates, so long as a forty-mesh screen was used. A thirty-mesh showed an additional loss of ten per cent, which was remedied by replacing the forty-mesh.

A short piece of amalgamated copper plate has since been placed directly under the discharge of the mill, and while saving practically all visible free gold, does not appreciably increase the total percentage saved. Some small lots of custom ore have been worked. The results of one lot show the following figures:

4¼ tons of ore worked yielded of free gold, 2 oz. 8 grs.	$ 29.00
Concentrates, 1200 lbs, containing	124.23
4 tons (scant) of tailings, containing	5.80

The assays of concentrates showed—

Silver	8.5 oz., worth $ 6.12, at 72c. per oz.	
Gold	8.50 oz., worth 200.93	
		$207.05 per ton.

Tailings averaged—

Silver	.36 oz., or	$ .25 per ton.
Gold	.07 oz., or	1.45 per ton.
		$1.70 per ton.

These results were obtained on undecomposed ore, and in handling a ton in from six to eight hours. On decomposed ores, with forty-mesh screen, the results have been a trifle less thau when worked in stamp mill or arrastra. E. L. BALLOU.

Falls Minc, Igo P. O., Shasta Co., Cal., Jan. 26, '95.

Geographical Society of the Pacific.

The Jauuary meeting of this society was held last Tuesday evening at Uniou Square hall. Henry Lund, Consul for Norway and Swedeu, who has receutly returned from a vacation in Europe, read an interesting paper on the "Lost Relics of the Jeaunette Expedition." These relics, it will be remembered, were removed by Lt. De Long's party from the steamer before she went dowu, off the Siberian coast, and abandoned on an ice floe when the start was made for shore. The floe carried them across the Polar sea, dowu the east coast of Greenland, and they were picked up in Baffin's bay after three years' voyaging. The Governor of Greenland sent them to Copenhageu where they were stored and finally thrown away as worthless. Their value to scientists is, that they showed the existence of a current crossing the mysterious Polar sea, that unknown region which has baffled so many well-planned expeditious. Prof. Nordenskiold is now up there with a specially built vessel, in which he will seek to reach the point where the Jeanuette was lost, and thence drift with the icebergs over the course the relics took, coming out near Greenland. Mr. Lund was followed by Professor Davidson with a paper ou "The Military Status of China," by Rev. Gilbert Reid, Chief of the Missiouary Board at Shanghai.

The uext meeting will be addressed by Professor J. M. Schæberle, of Lick telescope fame.

ELECTRIC CLOCKS are becoming familiar everywhere. The process by which they are set is the inveution of W. F. Gardner of Washington, D. C. Every day in the year, at five minutes before twelve, the Western Union Telegraph Company stops all business and throws open all circuits. At noon precisely a button is touched in the Naval Observatory at Washingtou, and an electric spark flashes to all parts of the country, causing the hands of 100,000 clocks to point to the hour of twelve. The same spark causes time-balls to fall at all seaports along the Atlantic and Pacific coasts. These time-balls are for the benefit of marines, enabling them to regulate their chronometers.

THE largest permanent store of coined money in the world is in the imperial war treasure of Germany, a portion saved for emergencies from the $1,000,000,000 paid by France after the Franco-Prussiau war aud locked up in the Julius tower of the fortress of Spandau. It amounts to the value of $30,000,000.

THE best burglar-proof safes are made of alternate layers of hard aud soft metal, which are welded together. This combination will not yield to either drill or sledge-hammer.

Public Expenditures.

There is a direct relationship between prudeuce iu public expeuditures and political morality; and by those whose eyes are open to the deeper significance of things, this fact appears the most important of the many cousiderations supporting the reform effort at Sacramento. Reasonable appropriations for legitimate purposes would make the State service a business instead of a political organization aud would preveut the ten thousand petty corruptions which destroy the dignity of official life and degrade to a greater or less degree the character of everybody connected with it. Thus a system of reckless expenditure first impoverishes the tax-payer and then vitiates our public service. It is not too much to say that every dollar unwisely spent in an economic sense is a dollar viciously spent in a moral sense. It is the illegitimacy of our public expenditures which makes the scene alike pitiful and shameful just now to be witnessed at Sacramento. The State Capitol swarms with place hunters of every age, conditiou and sex—present not because they have any genuiue taste or capacity for public service, but because it is kuown that effrontery, importunity and petty bribery may open to them small streams of illegitimate profit at the public cost. There is now in session at Sacramento a legislature elected in the midst of hard times and pledged to economy; but in spite of these facts, it is spending $728 per day for clerk hire. Of course, everybody knows that this is unnecessary and without excuse; that the legislature would be better off if it would go about its work unannoyed by a swarm of sinecure employes. It is illegitimate, it is vicious—but it goes with the system and will continue until the system shall be superseded by another founded upon and limited by the necessities of the public service. Another fact very notable at Sacramento just now is that funds appropriated for the promotion of certain large public intents are being speut to secure still further appropriations. Thus, State money given into the hands of commissions is being used to perpetuate the life of these commissions rather than for the purposes for which it was (with rather more than less impropriety) originally designed. It might further be shown how there is at Sacramento a powerful lobby of present officials, of prospective officials and of political managers united in a defensive fight for the system as it now exists. These facts illustrate the connection between public extravagance and political immorality; and they afford the best possible reason —a reason even more vital and profound than the purely economic motive upon which the reform movement is founded—why the whole system should be swept out of existence. Does anybody suppose for one moment that, if State appropriations were given only to legitimate uses, and if places and salaries were limited to legitimate service, that the gang which now discredits the State and degrades itself would be found at Sacramento?

A DENVER MANUFACTURER who recently returned from a business trip to Mexico, explains to the *Rocky Mountain News* why American trade with Mexico is rapidly falling away. He says the reason is the high rate of exchange made necessary by the difference in the value of the dollars of the two couutries. Relatively to commodities, Mexican dollars are the same in value as they were before 1873, while the American dollars have doubled in value. That is, a ton of wheat or a bale of cotton will command as many dollars as ever in Mexico, while they will command only half as many in the United States. The result is that when a mining or other operator in Mexico purchases a plant of machinery in the United States, say at $2500, he is compelled to pay $5000 for it in his own money. The difference is the exchange rate between the two countries. Mexicans are getting very tired of this, with the result that they are not only curtailing foreign purchases, but are rapidly, under the protection which this high rate of exchange affords, building up manufactories of their own and becoming independent of the United States and Europe.

The statement of the Denver manufacturer to the *News* is in harmony with that lately made by Americau Minister Grey, who about a month ago returned from the City of Mexico to his home in Indianapolis. Mr. Grey declared that capital was eagerly seeking investment in Mexico, that manufacturing industries and railways were rapidly increasing, and that the country was making extraordinary progress and enjoying extraordinary prosperity.

PROFESSOR HEILPRIN says in the *New Science Review* that, however tempting other explanations may appear, scientists have gradually settled down to the conviction, made inevitable by a practical demonstration, that the guiding power of ocean currents is resident in the non-periodic winds, or such as blow constantly from definite quarters.

MARINE INSURANCE was practiced in Rome B. C. 45. It was very general in Europe before the discovery of America, and it is altogether probable that the ships of Columbus were insured for their full value.

Some Commendatory Notices.

The following from our friends of the interior illustrates the feeliug with which this paper is received in all mining communities. Space precludes the reproduction of more than one-tenth of such comments which, though not republished, are uone the less appreciated:

Brighter Than Ever.

The MINING AND SCIENTIFIC PRESS, published at San Francisco, has just ended thirty-four years of usefulness, and is brighter than ever. This journal has filled a field, and filled it so well, that it now ranks above any of its kind in the United States. Being published in the very midst of the mining industry, it has advantages which others do not possess. We wish the publishers continued prosperity.—Auburn Republican.

Valuable Information.

The MINING AND SCIENTIFIC PRESS has entered upon its thirty-fifth year with indications of increased prosperity. It devotes much space to the mining industry of the Pacific coast, laying before its readers valuable information relative thereto. It should receive hearty support among the miners. —Plumas National Bulletin.

A Good Paper.

With the issue of December 29, 1894, the MINING AND SCIENTIFIC PRESS completed its sixty-ninth volume. While a "class" paper it has been for more than thirty years a welcome visitor in every mountain household. Abounding in matter of interest to miners, it has carefully withheld the use of its columns from the *promoter* and the *boomer*, who for many years have been a dead weight on the mining industry of the State.—Plumas Independent.

A Journalistic Success.

With 1895 the MINING AND SCIENTIFIC PRESS, of San Francisco, begins its seventieth volume and thirty-fifth year of publication. This journal is one of the most widely and favorably known on the coast, and we have yet to find the first subscriber to it who has anything but good words for it. It is one of the journalistic successes of the West, and we hope it will enjoy continued prosperity.—Inyo Register.

Reliable Information.

The MINING AND SCIENTIFIC PRESS has completed its sixty-ninth volume and is thirty-four years old. It is the oldest paper of its class in the United States, and the best paper we know of to afford reliable information concerning the mining industry of the Pacific coast. Every mining man should read it and keep up with the times.—Placerville Republican.

Money Well Spent.

Miners should take more interest in the MINING AND SCIENTIFIC PRESS, at least in this section. It has just closed the thirty-fourth year of its existence, and certainly keeps apace with the progress of the age. Go to Shepherd, or to any other news agent, and subscribe for that excellent organ of your industry, and we know you will not regret it. Its price is $3, but it will be money well spent.—Georgetown Gazette.

The Peer of Any Publication.

The MINING AND SCIENTIFIC PRESS, of San Francisco, has just entered upon a new volume that will close the thirty-fifth year of its publication. As a practical journal for miners, it is the peer of any publication in the world. It has established a reputation for accurate and reliable information, and is up to date in all informatiou concerning the mining industry. Perhaps the greatest compliment the MINING AND SCIENTIFIC PRESS has received was the notification from the United States Committee on Awards of the World's Columbian Exposition that the paper had received an award "for its general excellence and reliability, and the fullness and accuracy of its reports."—Colfax Sentinel.

MR. THWAITE, the gas engineer, proposes to use blast furnace gases as a source of power. He points out that whatever experiments or proposals may have been previously made in this direction, they could hardly have been on all-fours with his present scheme, which aims at the direct transformation of the heat of the gases into power iu the immediate vicinity of the blast furnaces, and by means of the direct combination of gases in internal combustion engines of the largest powers available at present—up to 650-horse power—he proposes to convert this power into an electrical form of energy, at high pressures, for distribution to any works or electric light installations within a twenty-mile radius of the blast furnace.

AT the annual meeting of the stockholders of the Utah Con. Mining Co. on the 30th ult., 87,725 shares were represented and the following officers were elected to serve for the ensuing year: H. B. Havens, president; George R. Wells, H. Zadig, E. B. Holmes and A. S. Wollberg, directors. A. W. Havens was re-elected secretary and D. B. Lyman superintendent. The secretary's financial report shows a credit of $2612.

THE Colorado Fuel and Iron Company, Pueblo, Colo., the only producers and manufacturers of iron and steel in Colorado, turned out the following products during the year 1894: Pig iron, 70,961 tons; spiegel, 3,923 tons; castings, 3,109 tons; steel rails, 66,619 tons; spikes, 846 tons; merchant iron, 6,678 tons; steel angle bars, 844 tons; iron ore smelted, 156,997 tons.

ACCORDING to the *Gas World* the intrinsic brilliancy per uuit of area of the filament of an incandescent lamp is 133 times greater than that of the gaseous rival which has appropriated the first half of its name. It seems probable that in this estimate the meshes of the gauze in the latter lamp have been taken as if solid.

MR. FLOOD leaves this evening for a month's trip to New York, where he is to meet Mr. Mackay, on business, who is unable to come to this city.

LOCAL MINING COMPANIES disbursed $99,700 dividends in Jan., '94, and $180,250 in Jan., '95.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XX.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1891, by Henry G. Hanks, F. G. S.

1867.—In this year Professor Silliman wrote his celebrated paper on California petroleum, which called forth so much comment. It was published in *Silliman's Journal*, April 1, 1867, previous to its being read before the California Academy of Sciences, April 1, 1867, for which reason it was not published in the proceedings of that society.

The conclusion of this paper was published in the MINING AND SCIENTIFIC PRESS, vol. 14, fol. 215.

Oil operations ceased in Humboldt county in most cases. The Irwin Davis Company, by means of a portable engine, sank 626 feet, and the Union Mattole Company at 390 feet obtained thirty gallons of oil per day.

Lyon and Jenkins returned to the claims they had abandoned ten years before. Jenkins went to Sespe and Piru; Lyon remained at Pico. Lyon's Station was named for him. He died in 1883.

The "Fargo" well, sunk in Moody gulch to a depth of 400 feet, yielded one barrel of oil per day, and from a well at Griswold's place, two miles from Lexington, 500 feet deep, oil and salt water were obtained.

In a well in Colusa county, the water was seen to rise like the tide at 3 P. M. and 6 A. M. At Antelope valley, eighteen miles north of Oil Center, in the same county, there was a salt water pond, and salt water was found in wells sunk for oil. At this time, eight oil wells had been put down in Colusa county.

On January 28th, twelve barrels of crude oil were shipped from Pico canyon, Los Angeles county.

Among the mineral specimens sent to the Paris Exposition of 1867 from California was petroleum from Mattole and Joel's Flat, Humboldt county; Noble's springs, Santa Barbara county; Wiley's springs, Pico canyon; and Hughes' springs, Los Angeles county; Hayward & Coleman's and Stanford Brothers' claims, Sulphur mountain, Ventura county; from Canada Larga and Charles Stott's claim, Santa Barbara county; from Santa Cruz county; and from Bear creek, Colusa county.

Experiments made at Corral Hollow, San Joaquin county, to distill coal oil from shale were not a success.

Previous to 1867 nearly all the California asphaltum in the State was mined in Los Angeles and Santa Barbara counties. The best market was San Francisco, where the price was from $15 to $20 per ton.

1868.—In 1868 Hayward & Coleman, of San Francisco, advertised "superior lubricating oil, manufactured from California petroleum."

Mr. Davis leased Wiley springs, in the San Fernando mountains, three miles east of Pico canyon. He collected all the oil he could from the surface and sent it to the Metropolitan Gas Works in San Francisco; this was continued for about one year. This company's office was at that time at 810 Montgomery street.

1869.—An extensive petroleum business was conducted by the San Buenaventura Manufacturing and Mining Company, incorporated with a capital of $2,500,000. This company owned all the known oil springs in Santa Barbara county, except the Ojai wells, some distance inland. Several experimental refineries were discontinued. A number of establishments began to use petroleum for fuel.

The first important work was done at Pico canyon by Mr. Hughes, who put down a spring pole well named "The Pico."

1871.—Petroleum was discovered on Augmentation rancho, Soquel, Santa Clara county, and in Livermore valley, Alameda county; the former discovery was by a party of hunters, who found the water nauseating from the presence of coal oil. The Livermore discovery caused considerable excitement. At the depth of fifty-five feet, in a well being put down, gas ignited at the flame of a candle and a constant roaring sound was heard at the bottom of the well. The blue mud taken out smelled of oil and sulphur.

James P. Sargent owned an extensive area on the Juristo rancho, about four miles from Gilroy; the beds of brea covered about twenty acres. During this year they produced 500 tons of asphaltum.

1872.—Charles Stott again worked at Sulphur mountain, Ventura county, with better success. One hundred barrels of oil from Pico canyon, San Fernando district, Los Angeles county, were shipped to San Francisco for an experiment in refining.

1873.—The San Fernando district, lying thirty-five miles from Los Angeles, and thirteen miles from the mission of San Fernando, had two tunnels driven into the hills, one 70 and the other 100 feet long, from which oil flowed in a continual stream. It was conducted in iron pipes to large tanks. Oil was also dipped in buckets from superficial springs.

It was proposed to build a refinery at Los Angeles, and the following estimate of the cost of refining was published:

Cost of oil at wells or depot—cents	15.0
Hauling	2.5
Refining	2.5
Packages	3.0
Sundries	1.0
Total cost	24.0
Market value	40.0
Profit	16.0

The Star Oil Company built their first still in San Francisco, and shipped it to Los Angeles. The refinery was located at Lyons' station, one mile from Newhall. The works were under the superintendence of William B. Smith, refiner. This was the foundation of the refinery near Pico. Wood was used as fuel; there was a diversity of opinion as to the true nature of the oil, and the proper way to refine it; no satisfactory results were obtained, and in 1876 the works were sold to Scott and Baker, who also failed to make them pay. Mr. Shoemaker succeeded them, but could not make sufficient oil to be profitable. Mr. A. J. Scott then took the refinery and met with fair success.

1874.—Messrs. Temple, Moore and Pico worked in Pico canyon, Los Angeles county. The oil they obtained was sent to the refinery at Lyons' station. At this time there was considerable activity in the production of petroleum at Sulphur Mountain, Ventura country. Hayward's claim produced ten barrels daily of 32° gravity oil; Stanford's, six barrels daily; the Santa Paula Oil Company, ten barrels daily; the San Fernando company, near Camulos, about ten barrels daily. All this oil was obtained from natural flows. Two hundred barrels per month were used by the Central Pacific railroad for lubricating purposes, but there was but little other demand for the crude oil. There were also some new oil springs discovered in Sespe cañon. A deposit of asphaltum was discovered in San Luis Obispo county, on land owned by Steele Bros., and a contract was made to haul fifty tons to landing to be shipped to San Francisco.

The Chandler Oil Mining Company of Los Angeles was incorporated in February, of which George Caffey was president, and C. H. Howard secretary. B. Chandler was superintendent.

The company's wells were at Petrolia, on section 5, township 3 south; and range 9 west. The company commenced operations on section 1, range 10 west, and obtained oil at a depth of from 100 to 300 feet. The oil had a density of from 15° to 30° Beaume. One well produced 150 barrels, which sold for from $4.50 to $12 per barrel. Mr. Chandler informed me that within two years 500 barrels had been produced at Petrolia, which I visited in May, 1884. Two wells were being sunk. No. 1 was down 290 feet, and No. 2 240 feet. From No. 1 quite a quantity of black tar oil (maltha) had been pumped. A tank holding from seven to ten barrels was standing full. Common brea, which contained what seemed to be jonite, was burned under the boiler and was the only fuel used. (The presence of jonite was also observed at Sargent's, Santa Clara county.) The wells at Petrolia are on small foothill elevations above Anaheim; the direction or trend of the hills is about east by south. A small creek runs down, south by west, to the plains; on both of which brea has flowed and formed terraces as at Sargent's, and the "black tar" is similar. Of the brea there are a number of varieties—some cellular, like volcanic scoria, and mixed with sand; several grades of maltha, and some brown and light-colored bitumens resembling jonite. In several directions from the oil wells might be seen extensive patches of crude brea which had flowed from the hillsides. Mr. J. W. Snow's well was about a mile from Petrolia; it was 550 feet deep, but unfortunately for the owner it was a dry hole. This well was at first a square shaft 44 feet deep, from the bottom of which a six-inch well was sunk through the soft sandstone. At 250 feet and for 150 feet lower, sandstone was pierced. The sand was like that in the brea.

1875.—The estimated sum total of crude oil produced in the State up to date was 175,000 barrels.

1876.—During this year the California Star Oil Company of Los Angeles was engaged in sinking wells in Pico canyon, Los Angeles county; the yield of the district was forty barrels per day. The State production of oil for the year was 12,000 barrels, making the total yield to date 187,000 barrels.

1877.—The California Star Oil Company, under management of J. A. Scott, produced twenty barrels of refined oil at the Pico refinery. The Ventura wells were pumping eighty barrels daily; those of Pico canyon from forty to fifty. For the first time steam machinery was used in sinking wells at this locality.

Thirteen thousand barrels of crude oil were produced in California in 1877, making the total from commencement 200,000 barrels.

The Columbia well at Buena Vista, Kern county, was drilled by Mr. Meyers. At 300 feet the bit penetrated a cavity of oil and gas, which raised the tools 120 feet and entangled them with the rope. After this accident the well was abandoned.

Charles N. Felton and P. C. McPherson commenced work in Moody gulch, in the Santa Cruz mountains, on the old Boyer well. At 700 feet a rush of gas and oil occurred, which rose 100 feet above the mouth of the well, and 100 barrels of oil were said to have been lost. For some time after, sixty barrels of oil having a gravity of 46° were pumped from this well. The oil was sent to the refinery near Newhall, Los Angeles county.

1878.—In September of this year, in a communication to the MINING AND SCIENTIFIC PRESS, Mr. Edward Madden, an oil expert, stated that the oil of Ventura county was inferior to that of Pennsylvania as an illuminator, but superior as a lubricator. In the same paper he gave the production of the Star Oil Works at 150 barrels per day and the yearly consumption of oil in the State at 3,500,000 gallons, valued at $1,000,000. His opinion based on surface indications was that the southern portion of Los Angeles county was full of oil. The total production for the year was 15,227 barrels; total production to date, 215,227 barrels.

1879.—On the 10th of September the Pacific Coast Oil Company of San Francisco was incorporated. There were five wells at Pico from 200 to 600 feet deep, eight in Ventura county on ex-Mission lands, all yielding oil by pumping, and one well at Sespe, 1500 feet deep, yielding 100 barrels of oil per day. A refinery at San Buenaventura caught fire and was blown up. The yield of oil in the State for the year was 19,858 barrels and the total to date 253,085 barrels.

(To be Continued.)

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It has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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Scientific Progress.

Economy Through Thermal Storage.

Not only does the modern steam-power plant extract a mere fraction of the latent euergy stored in the coal cousumed, but that fractiou is often subject to serious diminution where the work to be performed varies from hour to hour. It is a well-known fact that the proportion of fuel required to each horse power used is greater in such a case than when the work coutinues at an eveu rate through the whole twenty-four hours, as, for instance, on an oceau steamship. In electric light and railway stations the "load" is very heavy during part of the day, and very light during the rest of it. It has been computed by Prof. Forbes that even with the most careful management the extra fuel burned in a lighting station amounts to forty-three per cent of the quantity that would otherwise be used; and with less care the excess would be still greater.

How to avoid this waste is a problem for which experts have found various partial solutions. One plau that has recently been adopted by progressive managers is to run the engine at a proper average speed right through the day, to store most of the electrical output in accumulators during the comparatively idle hours, aud then to draw on these as well as the dynamo when the load is at its maximum. But such a system adds largely to the original cost of the outfit, and, it is alleged, wastes at least twenty per cent of the stored euergy. It seems probable, therefore, that what is called the "thermal storage" idea, which has yielded excellent results abroad, will receive increased attention.

A plan adopted with a satisfactory degree of success maiutains a uniform fuel consumption, and when the load is light conveys the surplus heat to water tauks, which are suitably connected with the boiler, and whose capacity has been very carefully adapted to the requirements of the station. Iu these tauks the temperature is permitted to rise considerably above what would be the boiling poiut in open air, but as the water is kept under high pressure aud no surface is exposed, no steam actually forms, except in the boiler. This storage goes on until, when the hour for the maximum load has arrived, the temperature is about 406° Fahr., say. This is equivalent to a pressure of 250 pounds to the square inch. It is desirable, let it be assumed, to run the engines during the period of heavy work at 130 pouuds pressure, to produce which, normally, a temperature of 347° would be necessary. So great is the quantity of heat actually stored in the tanks that the boiler will make steam fast enough to keep the pressure above this minimum until the time comes for taking off the load. Then, of course, the accumulation of energy is resumed, and proceeds gradually as before.

It will be seen that the boiler proper ueed have a capacity only suited to the mean of the whole day's requirements, and not, as in other plants, equal to the utmost demands at the very busiest hour. Hence it has been found that the cost of the plant, including ten or a dozen tauks with the proper fittings, may be considerably less than that of the type now iu common use.

The "heat storage" plan here described is au improvement on the steam-storage system, which has been tried with good results, but which requires larger and more tanks. There is also iu contemplation a combination of the two. To install it, however, costs more than the simple heat-storage outfit.

THE French Societe Technique offers the following prizes to persons of any nationality: £409 for a markedly better incandesceut gas lamp, to be sent in before April 1, 1895, the council to decide whether the time may not be extended to May 1, 1896; £320 in various prizes for essays on any subject affecting the gas iudustry, particularly on mechanical handling of coal, coke, etc., ou water, gas or revivificatiou, or on the substitution of hydrocarbous for cannel; £80 between those who have made the greatest progress in apparatus for making or using of gas. Papers to be in French, and unpublished; motto, with uame iu envelope, and a declaratiou inside that the paper is unpublished, aud that the author will not publish otherwise for a year. To be sent to the Societe, 65 Rue Provence, Paris, by the eud of April next. Also prizes of £10 to the authors of the best papers at the aunual meeting, provided iu this case that they are members of the Societe.

The Electric Incandescent Lamp.

The best and, in fact, the only really efficient incandescent electric lamp of to-day, says J. H. Cunz, in *Cassier's Magazine*, is characterized by a continuous glass chamber, from which the air has been exhausted and in which is the light-giving carbon filament, supplied with current by platinum wires, sealed in the neck of the glass bulb. This seems a simple enough contrivance, but the preparation of the materials and the putting of them together involves the greatest care, and the presest high state of the art has been attained only after many years of ceaseless labor and patient effort.

The carbon filament has probably caused more work and worry than all the rest of the lamp put together. It is the essential part. Uutil lately the raw material for its preparation was bamboo, which was cut into thin strips and carbonized, but now some artificial compound of carbon is used, the exact nature of which is kept secret. This substauce is cut into thin strips, and is carbonized by heating in a suitable furnace. These carbonized filaments are of various lengths and thicknesses, some having a diameter of only five-thousandths of an inch, and are bent into different shapes, the one most favored at present being the spiral. At the largest lamp works in the United States all the sixteen-candle power high voltage lamps—the most common size there—are now made with spiral filaments, as well as all lamps above sixteen-candle power. The more familiar "horse-shoe" and "hairpin" filaments, however, still have a place in the art, particularly in the smaller-sized lamps. Sixteen, twenty, twenty-four and thirty-two-candle power fifty-volt lamps are still made in plain loops, and probably always will be.

A New Electric Process.

One of the most remarkable of recent inventions is a process for making caustic potash aud soda out of brine. These substances are utilized in the manufacture of soap, glass and paper. Hitherto they have been obtained by costly methods, the production of them being a very important industry in Great Britaiu. Nearly all of the soda and caustic potash used in this country is imported from Englaud, amouuting to millions of dollars' worth annually.

It has been discovered that these alkalies may be obtained by decomposing brine by means of electricity. The brine is got from salt wells Sea water would serve, but it is not as good for the purpose because it contains much less salt. Already the manufacture of caustic potash and soda has been begun in Michigan and elsewhere in the United States. The matter is exciting great attention here and abroad, and all the leading chemists of the world are working at it. The inventor of this process is a Belgiau uamed Hermite.

In Europe they are uudertakiug to disinfect cities by the use of this process. All that is ueeded is to run wires from a dynamo iuto a vessel of sea water, and the latter yields a product which is the same thing as what is commonly known as "bleachiug soda." The stuff is so cheaply obtained that it is being used to purify sewers aud is poured iuto gutters. Eventually it will be extensively employed in the sprinkling of streets. By this means of wholesale disinfection, which signifies the destruction of disease-produciug germs, cities will be rendered much more healthy in the future.

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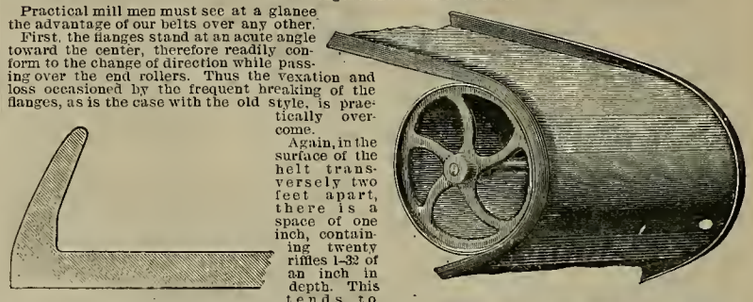

Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.

Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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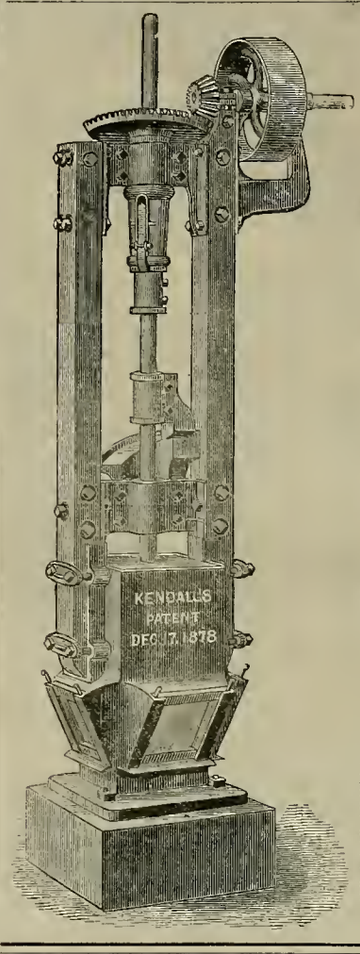

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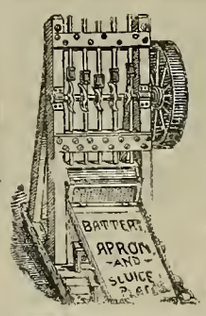

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Mechanical Progress.

Value of Mechanical Skill.

A subject that appears well worthy the attention of the apprentice and young mechanic is the actual difference between the value of thoroughly skilled and competent labor, and half-skilled and incompetent labor. At first thought it would seem that if one mechanic were capable of doing two-thirds as much work as another, in order to do exact justice to all parties he should receive two-thirds as much wages. In point of fact, however, there would be injustice in such arrangement. In order to divest the matter of the wages aspect, let us suppose that two men enter into partnership, and that the better workman can perform labor representing $1500 per year, and the poorer one two-thirds as much, or $1000 per year. Suppose, further, that they find the interest on the plant required to conduct the business, sinking fund and incidental expenses, to be $1200. Since it is evident that each will occupy the same amount of room, and that each will require the same tools with which to work, it is evident that the $1200 in the way of expenses should be equally assessed, and that the amount to which they would be equitably entitled in the way of wages would be $900 and $400 respectively. In other words, the one who does one-third more work than the other is, in strict justice, entitled to two and one-fourth times as much as the first. Now, the matter would in no sense be changed, if, instead of working for themselves, they work for a third party. It is a consideration of this fact that leads far-sighted employers, especially in a business that calls for large expenditure in the way of tools, etc., to look for very competent men. It is always apparent that the mechanic who has given the greatest amount of energy to thoroughly comprehend and manage his business is always the one who has work and good wages without much reference to the times. He who by diligence fits himself to do more and better work than another will find himself much better paid, and in a greater degree than would be indicated by the extent of his superiority. In this there is nothing but exact justice to all parties. There are, to-day, greater inducements for the young mechanic to improve and perfect himself in his trade than ever before. The absolute value of skill, from a business point of view, is fairly appreciated by those who have the hiring of it.

Electric Power in Manufacturing Establishments.

There have been many cases of the use of electric motors to drive lines of shafting or isolated parts of plants to prove conclusively the remarkable increased efficiency obtained, especially where the conveyance of steam for a long distance was necessary. This has led to a more thorough study of the amount of power absorbed by the line shafting and countershafts. W. E. Hall, in *Cassier's Magazine*, says the minimum loss that can be looked for—and this is obtained only in exceptional cases requiring constant vigilance—is twenty-five per cent of the total power developed, and more frequently runs as high as sixty-five to seventy per cent. A safe average would be from forty to fifty per cent, although the actual loss must be determined for each and every case. With the use of electric motors, when properly designed and proportioned for the work, as, indeed, is as necessary in electrical work as with any other problem of mechanics if the best results are desired, this percentage of loss can be materially reduced. An inefficient result must be expected with bad electric engineering just as with a poorly arranged case of millwrighting; but, the electrical proportions being once obtained, there will, within reasonable limits, be no decrease in efficiency from deterioration.

The advent of electricity for such purposes seems to have enabled managers to realize more fully than ever before the loss accompanying what was heretofore generally accepted as the most efficient method of furnishing power to the individual machines of a plant. The use of electric motors in the place of shafting and on isolated machines where the motors are belted direct to the isolated shafts or to the machines has been sufficiently extended to render the verification of the results obtained unnecessary. It is no exception to find a reduction of fifty per cent of the power consumed. This is not due entirely to the saving of loss through friction, but also to the advantage gained by the intermittent action of machinery of every kind. Tests show that where the motor drive has been substituted, the machines are in operation but little more than one-half the time, or, more correctly stated, the power required is only about one-half the total average power of the machines when doing work. As remarkable as these results may seem, sufficient data are on record to prove their correctness.

In the forced draught trials of modern high-speed vessels and the terrific strains endured by the several members of the engines, the extraordinary integrity of the materials composing them is remarkable. This is in all cases machinery steel, and its endurance under the work done is sufficiently remarkable to warrant comment. Modern machinery of greater or less carbonization bears a certain stress in the testing machine, but this stress is in no degree comparable with the work demanded of steel under the crucial test of a forced draught trial. Then it is yank, jerk, and jar without end, each strain alternating, even combining with the other, and the whole kept up for hours at the very highest tension steam is able to put upon it. It almost seems at times as though upon the reciprocating parts that the heads would be jerked off of the bolts, and that no material could stand the usage that modern steel gets. With all this, the details are not heavy and clumsy, they are the reverse of this, being even lighter than they were many years ago. The fact of the matter is, that, in addition to excellence of material in the beginning, the systems of inspection, and thorough working that steel receives in modern forges, leave no flaw undetected. Breakdowns are very rare indeed, in comparison with the number of engines in use, which fact justifies our conclusions. — The Engineer.

It is remarkable, says the *Iron and Coal Trades Review*, how very many of the greatest inventions and discoveries of modern times have been achieved by men who were not themselves trained to the business or profession in which they acquired distinction. Neither Bessemer nor Siemens was trained as a metallurgist, and yet they have been proclaimed as the most epoch-making inventors in the history of the iron trade. Sir William Armstrong was not trained as an engineer, but as a solicitor, and yet he has revolutionized the art of gunnery and the manufacture of hydraulics. And so with many other modern instances. The so-called practical men are too often incapable of looking all round a subject, and are so wedded to usage and established rules as to look with serious disfavor upon any really novel ideas, however meritorious.

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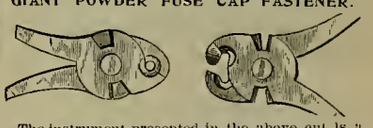

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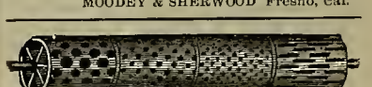

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GENERAL MINING ITEMS.—*Record:* The repairing of the Zeile shaft moves slowly, owing to the flow of water. Two buckets are constantly hoisting water. These take out nearly 200,000 gallons every twenty-four hours, and with this immense output the water is only kept at a standstill. The water is at the 900 level, with nearly 250 feet of sump.

At the Anita they are busy with the steam hoisting works. All the machinery is in place. The shaft, 100 feet deep, is full of water to within thirty feet of the surface.

At the Wildman mine the thirty stamps are busy night and day to their full capacity on fair-paying rock. On the 1300-foot level the south drift is now in 435 feet from the shaft. The size of the ledge and its quality remain the same as at the last writing. On the 1220-foot level the head of the south drift is now 225 feet from the shaft, with equally as good a showing as at the same distance from the incline on the lower level. The mine never looked better in its many years of active life than at the present time. The ledge is large, and the ore chute on the 1300 level has been run through a distance of 400 feet lengthwise of the ledge, with the end of it not yet in sight.

LIVELY NEXT SPRING.—*Republican:* Some old mines east of Sutter Creek, Amador county, are being reopened. Late reports from Plymouth and vicinity are of an encouraging character. The coming spring will see a small army of prospectors searching mountain-side and ravine for new mines. The boom that has lately struck Amador has not as yet added very materially to the output of '94, as a large amount of preparatory work has been necessary—pumping out old workings, rebuilding hoists, erecting mills, etc.; but the year of '95 should see a substantial evidence of the activity that marked the close of 1894.

The South Spring Hill mill will soon be started up on rock from the Median mine, which adjoins on the east. This property gives every indication of proving a good mine. A test crushing was made some time ago, and the yield was highly encouraging to the owners, although we are not in a position to state the exact amount per ton. The company has secured a bond of the El Dorado claim, which joins the Median on the south.

At the Kruger mine, in Hunt's gulch, they have been engaged on contract in sinking a shaft. They reached a depth of 120 feet, when the flow of water became unmanageable with the appliances at hand. About two weeks ago the shaft caved to within thirty feet of the surface, rendering it useless. It would cost more to fix it up than to sink a new shaft.

Calaveras.

MAKING A TEST RUN.—*Chronicle:* C. A. Rice has been making a test run of twelve tons of ore at the Tripp mill, on the Mokelumne river. The ore was taken from an old mine on the Peek ranch, about a mile and a half from town, and which has been bonded by the Linderaxa Mining Company. The mine was worked by Mexicans forty years ago, they having run an arrastra on the mine for two years. There are two shafts on the mine—one 50 and one 75 feet deep—and there is also a tunnel in 50 feet. A contract has been let to extend the tunnel 25 feet, work on which is now being prosecuted.

El Dorado.

UNTER DER LINDEN.—*Democrat:* When we mentioned the fact that the cleanup of twelve pounds and five ounces of gold from a run of five days, at the Lindeu, during the fore part of the month, was only a small draft on an inexhaustible deposit, we were not mistaken in our predictions. The last run of five days, made last week, coppers all previous runs by several pounds—the exact weight being twenty pounds. This is encouraging, not alone to the company, but to all of our citizens who have the mining fever in its most virulent form.

Mariposa.

Gazette: W. S. Chapman has purchased an interest in the Vanderhilt mine, and under his direction a new impetus will be given to the working of this mine. During the winter only a few men have been employed by Mr. Beebo, but as soon as settled weather comes an increased force will he put in the mine and mill. The mill is to be moved from its present location and ten more stamps added. The Vanderhilt is a good mine and can he made to pay under proper management.

Nevada.

RICH LEDGE UNCOVERED.—A rich strike has been made in the Hecla mine at Grass Valley. The quartz vein is narrow, from eight to ten inches, but it is expected to widen as it increases in depth, and the ore is full of free gold. Considerable rock has been extracted, and arrangements are being made to have it crushed at the Omaha mill.

San Diego.

The old Escondido mine is at present being shut down, but will soon start up again. An incline has been sunk on the vein to a short distance below water level, 80 feet. No drifting or stoping has been done below water. Some ore has been extracted and worked in a crude mill on the mine. About one-half mile northeast from this mine, on the same mineral belt, is the Oro Fino mine. An incline has been sunk on the vein to a depth of 75 feet, to water level, where a drift has been run southwest a distance of 15 feet, exposing a body of ore 20 inches in thickness in the backs. At a depth of 35 feet a drift has been run southwest along the vein 130 feet. Some stoping has been done above this level, and a quantity of fair grade ore has been extracted and milled. A Tustin pulverizer and gasoline engine are located a quarter of a mile below the mine, where the milling is done.

San Bernardino.

Our Vanderhilt correspondent writes: Shipments of ore and bullion from the Gold Bronze mine up to date amount to $50,000. The main shaft is now 287 feet deep, showing better grade of ore than at any other depth. The ten-stamp mill is running daily. Twenty-five men are employed at this mine.

At Boomerang mine, owned by the Brick Consolidated Mining and Milling Co., main shaft is 535 feet deep, showing good body of ore, sufficient water is hoisted from this shaft to run ten-stamp mill about twenty-two days a month. About thirty-five men are employed by this company.

Siskiyou.

GENERAL MINING NOTES.—*Journal:* Austin & Co., of the Greenhorn blue gravel mine, are putting up more boxes, to put more men at work. The great amount of snow on the mountains will keep up the water supply for successful operations full-handed until late in the summer, or probably until winter comes again.

The Schroeder quartz mine at Deadwood mountain is still paying well, with a large force taking out quartz to keep the mill running steadily, notwithstanding the deep snow in the vicinity. By keeping the snow shoveled out between the tunnels and mill, there is no difficulty in operating the mine successfully during the entire winter.

Michael J. Loftus and brother, prospecting for quartz in the Shasta valley divide east of Scott valley, have found a good-paying quartz ledge seven miles from Fort Jones, east of Mount creek. The ledge is eighteen inches thick and prospects $17.50 per ton, besides containing a large percentage of silver. There is considerable snow at the mine at present, but it does not interfere with opening the ledge for development.

The new quartz mill the Jillson company is putting in to crush blue gravel, near Henley, is a ten-stamp one, double-discharge battery. The building which will inclose it is 24x84, and the height from the lower grade to the peak of the roof is fifty-eight feet. The wheel to furnish the power for the mill will he a six-foot one, under 300-foot pressure.

Hossick & Brown have commenced making a ditch on Humbug creek, to work their claim next month when the snow melts sufficiently, and expect to realize good pay, as their claim prospects well.

There need not he any complaint among the miners this winter about lack of water supply for any kind of mining, as there is an abundance to start the hydraulic giants and quartz mills everywhere. The river miners, of course, are driven out, but that is expected every winter when the heavy storms occur.

The Black Jack Co. will soon put up a quartz mill for crushing the blue gravel cement taken out of the claim at Cottonwood, and Jillson & Co. are also getting ready to put up their mill, the machinery for which has arrived at the depot in Hornbrook.

Tuolumne.

Independent: The Seminole mine, near Soulshyville, discharged fourteen men lately. Parties interested are here from New York, and will return and report. It is said that the plan of working the mine will be changed; that a tunnel will be run from the north fork of the Tuolumne river, and that a large mill will he erected at or near that point, but nothing can yet he confidently stated.

NEVADA.

J. Balzar and W. S. Dickerson have taken a new lease of the Pamlico mine, near Hawthorne, for 1895. Their lease includes the entire mine, but they will probably sublet the south end. Two and a half tons of ore from this mine, worked by an arrastra, yielded seventy-two ounces of gold, or $1224 at $17 per ounce. In one year two lessees of this mine, working themselves, have taken out $14,000 in gold.

ON THE COMSTOCK.—Dan De Quille: The various companies working mines on the Comstock lode will get through the winter in fairly good shape. The bullion now produced is mostly gold. There are several mines now producing milling ore. Much of this is of low grade, but its extraction and milling gives employment to men who would otherwise be idle. Of the productive mines the Con. Cal & Virginia is still in the lead, yielding an average of 350 tons of ore a week that pays over $60 a ton. In this mine marked improvement has been shown during the past week on the 1650 level. At this point a drift was run south, and after passing through low-grade material for a distance of 38 feet it cut into a body of ore that assays $30 a ton. This shows well for ore to the southward, both above and below, at that distance from the main winze.

The Savage has sent to the Nevada mill 270 tons of ore assaying $33.85 a ton. The streak of gold ore found on the 975 level of the Hale & Norcross mine continues, and during the week has yielded seven carloads of ore assaying $93.50 a ton. The Justice has yielded 153 tons, yielding $16.81 a ton, over half gold; Alta, 52 tons, worth $22.44 a ton. The Challar sent to the Nevada mill 235 tons of ore, assaying $30.50 a ton. The Potosi and Occidental have also yielded small amounts of pay ore.

TO BE REOPENED.—Genoa *Courier:* James Titus, who resided in Genoa in early days and went to Arizona, returned a short time ago with the intention of working a mine fifteen miles northwest of Mineral Hill, in the Pine Nut range of mountains. It was first located in 1859 and patented in 1867. The ore assayed $28 per ton in gold and silver. Mr. Titus had twenty-five tons worked in early days, but on account of the high rates charged for milling ore and working the mine it did not pay. He thinks now it can he made to pay a handsome profit. He says the ledge is twelve feet wide. There is a 200-foot tunnel that was run in early days, but it will require a large amount of work and no small amount of expense to open it again, as it is caved in for 100 feet or more, and timbers are rotted off. As soon as the weather will permit, Mr. Titus intends starting up work, and will build a dwelling near the mine. He says there are several hundred tons of rich ore on the dump, and that he will have it worked at Dayton or Silver City. He says he has been offered $25,000 for the property, and that it is worth more.

ARIZONA.

BRADSHAW DISTRICT.—The Reliable and Gladiator mills are running night and day on good ore from their respective mines. There are about twenty men working in the Gladiator and ten at the Reliable.

Work has started on the Peck mine. A. Falco has men at work cleaning out old tunnels, drifts and cuts. A contract for 150 cords of wood for the hoist has been let out, the water in the shaft, now about 500 feet deep, will be pumped out and the shaft and tunnels retimbered if necessary, then the old crosscut from the bottom of the shaft to the Occident, a parallel lead, will he pushed ahead. The Peck mine is the richest silver mine in Yavapai county, having produced over one million dollars in former years.

BRITISH COLUMBIA.

SLOCAN SHIPMENTS.—Slocan shipments in 1894 are valued at $564,800. The total amount of shipments reported is 4718 tons. Of this, 2152 tons went over the Nakusp & Slocan and Canadian Pacific. The total valuation of this ore is placed at $216,245, or about $100 per ton. Most of it came from the Alpha and the Slocan Star, though the Mountain Chief, Idaho, Reco and some of the Noble Five properties made shipments.

On the other side of the district, 2566 tons of ore left Kaslo during the year. The total value of this ore is placed at $348,582, or an average of $136 per ton. The average valuation of the 4718 tons shipped in both directions would he about $120. Of the Kaslo shipments the Great Falls smelters got about one-third, while Omaha took about one-quarter and Denver nearly one-fifth.

December shipments from West Kootenai are figured at $100,000. During the two weeks ending Jan. 8th, 1000 tons of ore were shipped from the Slocan district—mainly from the Idaho and Slocan Star—and the valuation of that fortnight's output is figured at $125,000.

The Hall mines at Nelson, though worked on a very limited plan, sent out 800 tons of ore, valued at $80,000. The Trail creek mines, which are just getting started, shipped about 2800 tons last year, which may he estimated at $140,000.

At Camp McKinney the Cariboo Mining Co. started up a ten-stamp mill last fall and are now shipping between $12,000 and $14,000 in gold bars every month, besides sending out concentrates. There are thirty men employed on this claim, which lies alongside the Amelia on the same vein. A ninety-foot shaft is being sunk to tap the tunnel on the Carihoo, the intention being to drift along the vein into the Amelia. The same company have purchased the lease of the Laura, a hydraulic claim, at Rock creek, fifteen miles from Camp McKinney, and will go to work on it in the spring, putting in a stronger plant.

NEW DENVER ITEMS.—The Noble Five has made another sale of 500 tons of ore to the Omaha smelter.

H. Sherau has sold a half interest in the Columbia on Trail creek for $4000.

Heavy hoisting machinery will be put in the Dardanells, and work on that claim is suspended till it is in place.

Work has stopped on the Cumberland owing to snow slides. This mine has shipped 120 tons of ore this winter.

The Government has been asked to extend the trail on Wilson creek to the dry-ore belt at the Dolly Varden group of claims.

OREGON.

Baker Co.

Democrat: The White Swan Mining & Milling Company, incorporated under the laws of Iowa, has bought the White Swan mine. A one-fourth interest in the property is retained by G. S. Tarbell, of Baker City, the discoverer and original owner of the mine, who has been superintending and conducting the property on his individual resources since the Union Mining Company was displaced.

The debts contracted by the Union Mining Company, amounting to upwards of $25,000, have been paid in full by the new company taking charge.

The transfer of the property will succeed Mr. Tarbell as manager of his own free will, and his successor will very likely he Col. A. H. Swan of Ogden, Utah, who is a stockholder in the company, and who was the promoter of the sale.

The White Swan has now a pay-roll of about $4500 per month, and as a producer of gold bullion has few equals in the Northwest.

Josephine County.

The Black Channel Mining Company are pushing development on their property; their tunnel is now about 1300 feet long. They will only run one giant this winter; they have thirteen men employed.

NEW MEXICO.

NEW SMELTER.—The American Zinc-Lead Company have recently completed a smelting plant at Ivanhoe, Grant county, where they will make a specialty of ore containing copper, but will treat all ore except heavy lead. They have secured the old Santa Rita copper mines, and several other properties containing an abundance of iron ore suitable for flux. The works are between Demipg and Silver City, on the Silver City and Northern Railroad, and are in charge of S. E. Bretherton, formerly superintendent of the American works at Leadville.

IDAHO.

The upper workings of the Gem mine are closed down, laying a number of men off. The sinking of the main shaft continues. Development on the first level continues, with enough ore coming out to keep the concentrator running twelve hours per day. The ore body uncovered at the first level is exceptionally fine, and the fact is developed that this is not the same ore body as that in the upper workings. The company is working about 60 men. The Frisco is working a full force.

MONTANA.

AT LUMP GULCH.—The Kennedy mine, located about a mile and a half west of Liverpool, now lying idle, was, a few years ago, one of the leading silver producers of the West, ranking with the old Legal Tender. About thirteen years ago the property was leased by M. E. Downs and O. R. Allen, who worked it until about two years ago, taking ore from the drifts and crosscuts above the 150-foot level.

Ore was taken out of this mine by the lessees and shipped to the Grant smelter at Denver, that was almost pure silver. Chunks of ruby ore were taken out that were worth their weight in coin. The writer was informed by an old miner who worked there at the time that ore shipped to the smelter yielded from $20,000 to $22,000 per ton.

After Downs & Allen threw up their lease, Kennedy worked the mine himself for a short time, taking out an immense sum of money. When the depreciation of silver came, Kennedy shut down the property, and it has remained idle ever since.

There are several mines in the Kennedy group, all of which are patented. On one of them a shaft was sunk 250 feet. The property is now in litigation, a mortgage on it being held by Thomas Cruse of Helena. It would be a great addition to the camp if the mine could be again put on a producing basis.

UTAH.

THE BULLION-BECK AND AJAX.—Tintic *Miner:* Samuel McIntyre, the new general manager of the Ajax Company, took charge of the property on last Saturday and immediately laid off all men employed there and ceased ore shipments. It is proposed to at once sink a shaft from the end of the tunnel level, which is in 200 feet, to a depth of fifty feet, and drift from that point. To that end a contract was let to C. S. Johnson of Eureka for sinking the shaft at the rate of $10 per foot, that being the lowest bid, and the work to commence at once. The shaft is to be 6x12 feet, and by sinking the 50 feet proposed they will be about 185 feet below the surface.

The Bullion-Beck Company has finished laying the new five-inch pipe line from the reservoir on the divide to the mill and closed up the ditch. The main portion of the mill will be up and under cover by the end of this week, and the work of placing the boilers and heavy machinery will commence at once. Work will commence on the tramway next week. Since the commencement of operations at the Eureka Hill mill no concentrates have been shipped, and it is estimated that there are on hand over 100 carloads. A few cars are now being loaded and will be shipped in a few days. Tuesday was pay day at the Beck, about $16,500 being distributed by that company.

THE plans for torpedo-boats Nos. 3, 4 and 5 have been received by the Iowa Iron Works, at Dubuque, which is preparing to bid on them. The faults in design and the placing of machinery, to which the builders attribute the mishaps attending the Ericsson's trial trips, are avoided in the plans for the new boats. Their speed will be 24½ knots, and the cost of all, including armament, is not to exceed $250,000. The Ericsson cost $113,000 without armament, and her speed requirement is twenty-four knots. Her trial trip will not be witnessed until late in March.

THE heavy seas rolling over the bar last Sunday played sad havoc with the north jetty trestle, and in a few minutes destroyed the labor of weeks. Thirty-one bents, representing 496 lineal feet of double-track trestle, with railroad iron, piling and everything, were carried away by the huge rollers. The breach was made by the sea end, leaving five lone bents standing out in the ocean, which threaten to go out also. Considerable of the wreckage has come ashore along the ocean beach and will be saved, but it will be impossible to replace the trestle work before spring.—Humboldt Times.

A SWEDISH ENGINEER proposes to do away with rifling in cannon by supplying each projectile with a gas-check to prevent any of the gas escaping past it. And then he would impart to the gun itself a rotary motion, at the instant of firing, which would give the projectile the necessary twist. The benefits thus derived, he intimates, would be reduced cost of construction and longer life.

Coast Industrial Notes.

The Victoria sealing fleet took 94,474 skins in 1894, as compared with 70,332 in 1893.

—The British Columbia salmon pack in 1894 was 494,470 cases, against 596,584 cases in 1893.

—The capacity of the Roche harbor lime works, on San Juan island, is 1500 barrels per day.

—There are twelve vessels loading at the Port Blakely, Wash., mill, and the big plant has resumed running nights.

The Sacramento and Ione Coal Company will soon go out of existence. Their mine at Angels has been worked out.

The $200,000 Astoria, Or., water bonds have been sold to Rudolph Kleybolt & Co., of Cincinnati, for 95 and accrued interest.

—A line of steamers is to be established between Victoria and Mexico. The s.s. Danube of the C. P. N. Co. will make the first voyage.

—The $5,000,000 Lake Washington Canal bonds have been floated in St. Louis, Mo., and Seattle men expect to begin work thereon by the 15th prox.

—The Chuckanut stone quarry at Fairhaven, Wash., which has furnished stone for a large number of buildings in the Pacific Northwest, has a producing capacity of 10,000 tons monthly.

—Robert Chabot, who recently purchased eighty acres of swamp at Long Beach, Wash., for the purpose of engaging in cranberry culture, has contracted for 480 acres more, with the intention of still further broadening out in the industry.

—Under the income tax law an unmarried woman with an estate worth $5000 a year will be allowed the exemption of $4000, but if she marries she will have to pay the income tax on all, which is equivalent to taxing her $80 a year for getting married.

—There is a proposition on hand to let the State printing to the lowest bidder. During the past two years the printing bills footed up $219,950.37, and a San Francisco publishing house has made an offer to do the same work for the next two years for $50,000.

—During '94 there were shipped by cargo from Tacoma, Wash., 55,063,000 feet of lumber, a decrease of 7,000,000 feet compared to '93. Of the above this city took 16,952,000 feet, San Pedro, 16,647,000 feet. The valuation of the lumber shipped was about $570,000.

—A cable forty miles in length is being run through the snowsheds in the Sierras, for the use of the telegraph service. It will be an improvement over the old system of stringing the wires on poles. Nothing short of a landslide will interfere with or cause a break in it.

—During the week the proposed San Francisco and San Joaquin Railroad has received big impetus by substantial subscriptions of stock by prominent residents of this city, aggregating $1,300,000. It is considered certain that the project will now be pushed to successful completion.

—The new water works at Astoria, Or., will cost $150,000. The Pacific Paving Co. have the contract for grading and clearing, building bridges and culverts, digging and covering the pipe trenches and excavating the reservoir, for $19,740; lining the latter and building gate and power house, $16,207. The work begins March 1st.

—The valuation of foreign exports at Port Townsend last month was $689,501, and that of imports $124,343. The customs receipts from all sources were $16,890.45. The value of goods from British Columbia and Oriental countries passing through the district in bond and destined to Eastern cities was $522,335.13, of which amount goods, consisting principally of tea, to the value of $423,970.35 were admitted free of duty.

A SHARK STORY has recently been given out by the house of Grace & Co., of New York. It is in regard to a package of important papers that were lost overboard from the steamer Capac at Rio Janeiro, a considerable time ago, when she was on fire at that port. The papers were given up for lost, but quite recently some one killed a giant shark at Terre de Bas les Saintes, and among the bric-a-brac in his interior were the Capac's papers. They were turned over to a French resident, who sent them to the London Board of Trade, which delivered them to M. P. Grace, of the firm's London house, who advised the people here of their recovery. The fact that Terre de Bas les Saintes is up in the West Indies, some three thousand miles from Rio, makes the story all the more interesting.

THE U. S. Supreme Court has decided that the statute of limitations applies to claims growing out of patents the same as any other claims.

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Electrical Progress.

What Is Electricity?

It is often easier to name the sources from which a well-known thing is derived, and the effects it is capable of producing, than to explain what it really is. Hence the difficulties which have attended all attempts to define electricity are not without precedent or parallel. Faraday, Franklin, Maxwell, Hertz and others have contributed largely to our knowledge in this field, and our impressions of the subject have undergone more or less change; but to-day we are apparently as far as ever from a distinct, positive understanding of the true nature of this mysterious agent. Professor Rowland discusses "Modern Theories of Electricity" in *Engineering Magazine* in an intelligent, if not satisfactory, way; but the best he can do is to offer us negative and fresh problems.

Recognizing the trammels of tradition, and realizing that he cannot offer anything very tangible in the place of what he takes away, he confesses that "we cannot free ourselves from these old theories, and exactly suit our words to our meaning." At the very outset, he insists that "there is nothing more certain to-day than that electricity is not a fluid," and pronounces the term "electric currents" "unfortunate." And then he shows that just as Newton required the existence of an ether, filling all space, to account for the force of gravitation, so we must join Faraday in presupposing that same medium as a means for all the electric and magnetic actions we witness. That these actions occur along what we call "lines of force" or "tubes of force" has long been known. Maxwell's calculations as to the electro-magnetic nature of light and its transmission in waves, wonderfully confirmed by the demonstrations of Hertz, render the ether still more necessary to the solution of the problem. But the question then arises, how can "lines of force" arise in the ether? What is the ether, anyhow? Swift as light and electricity are in their movement through space, their journey from the sun to the earth requires appreciable time—eight minutes, at least; while gravitation acts instantaneously. That is an inexplicable inconsistency. Moreover, the ether does not retard the progress of heavenly bodies moving through it, nor impede the light rays from more distant objects which pass near to planets that might be supposed to attract it, in layers denser than the average, around them. Apparently, then, the ether is without weight, and we are forced to conclude: "Ether, then, is not matter, but something upon which many of the properties of matter depend. * * * Where is the genius who will give us an ether that will reconcile all the phenomena with one another?"

Tesla's "Oscillator."

Tesla's latest invention, the "Oscillator," is described as one of the most remarkable appliances of the age, consisting of "the core of a steam engine and the core of a dynamo combined, making a harmonious mechanical adjustment." This combination, says an enthusiastic admirer, constitutes a machine which has in it the potentiality of reducing to the rank of old bell metal half the machinery at present moving on the face of the globe. It may come to do the entire work of the engines of an ocean steamship within the small space they occupy and at a fraction of their cost, both of construction and operation. It will do this work without jar or pounding, and will reduce to a minimum the risk of derangement or breakage. There is nothing in the whole range of mechanical construction, from railway locomotives to stamp mills, which such an invention may not revolutionize. The essential characteristic of the machine is the application of the pressure of steam to produce the extremely rapid vibration of a bar of steel, or piston, which, in turn, is so adapted to a set of magnets that the mechanical energy of the vibration is converted into electricity. The extraordinary result is that practically an absolutely constant vibration is established, and a power is obtained greatly beyond that obtainable in the most costly expansion engines using a similar amount of steam.

Besides, it is said, saving in mechanical friction the thirty-five per cent of loss in the working of the engine, the fifteen per cent of loss in belt friction, and the ten per cent of loss wasted in the dynamo, making altogether an addition of sixty per cent to the available energy obtained from the steam for the purpose of producing electricity, it is simpler, lighter and smaller than the mechanism it is designed to replace, absolutely constant in its action, automatically regulated and subject to the least possible amount of wear and tear. The utilization of this machine in any branch of industry would, it is claimed, result in an appreciable lowering in the cost of production, and it is thought quite possible that its first general employment may be in electric lighting.

Recent Tests of the Telautograph.

For reasons not obvious, Dr. Gray's telautograph is attracting more attention abroad than in the inventor's own country. This is the apparatus by means of which writing or outline drawing on the tablet of a sending instrument is reproduced in fac-simile, on a corresponding instrument, electrically operated, at a distance. Each stroke, dot and dash is repeated automatically by a pen which follows the movements of the sender's stylus, and the likeness is so accurate that the chirography of a person at one end of the line may be recognized at the other by any one already familiar with it. Detailed reports are received of a recent test made between Paris and London, over a line 312 miles long, and including twenty-three miles of submarine cable (across the English channel) and five and a half miles of buried conductor (in the city of Paris). In England overhead wires were used. "Bichromate" batteries supplied the needed current at the northern terminus and Calland cells and storage batteries at the southern. Excellent results were secured. The highest speed attained was at the rate of thirty-three words a minute, and the writing was then rather ragged, though legible. This was slower work than is possible in ordinary hand telegraphy, to say nothing of automatic sending. But something else was gained instead of speed. The special value of this system is that it does not require a trained operator to use it. Fallible human intermediaries may therefore be eliminated, and absolutely faithful repetitions of a message or signal be guaranteed. A business manager, public official of high station, any one in a responsible position, in fact, may indite with his own hand a communication with the certainty that "what he says goes," and the recipient has a faithful record to preserve, if necessary, for his own protection.

ELECTRIC LIGHTS may now be shut off automatically at any hour in the night, and each one at a different hour, if necessary, by means of switches operated by alarm clocks in the hollow parts that sustain the lights. The alarm disc is set for the proper time. It is necessary, however, for a man to go around every day and wind up the clocks.

ON the railways in Denmark, the cars are lighted by electricity supplied by storage batteries. These latter are charged only at terminal stations. As the country is so small that the slowest trains only require about four hours to go from end to end of a road, this plan is quite feasible. It would not be so in this country.

A METHOD OF SILVERING GLASS has been invented in Germany, by means of which light is reflected from one surface, but is transmitted when falling on the other. In fact, it produces a transparent mirror. Such glass is admirably adapted for use in office windows on the street level.

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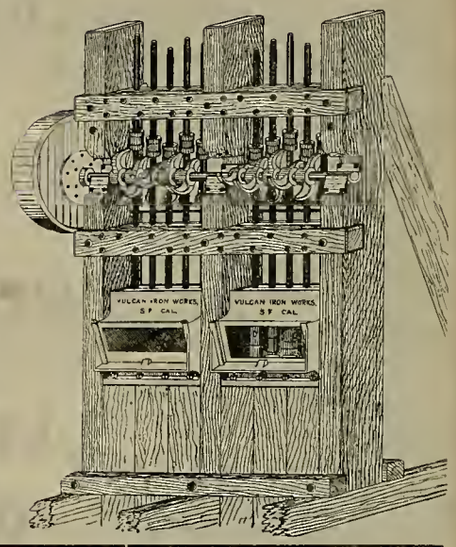

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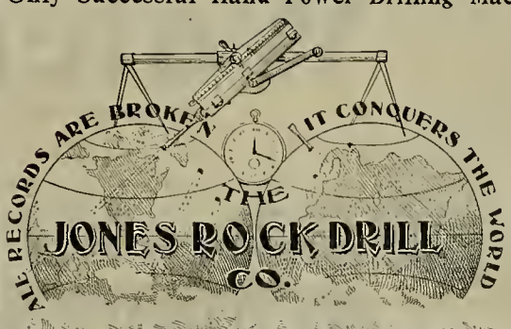

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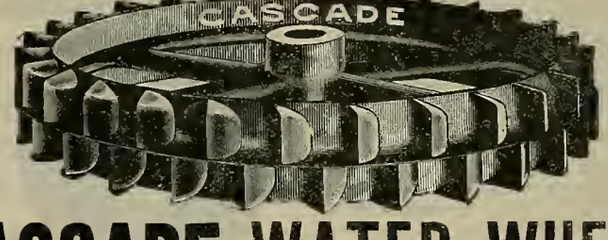
WATER 

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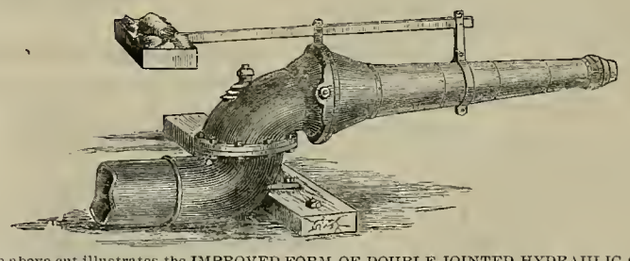

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The Whirl of Fortune's Wheel.

In connection with the gold strike at Leadville, C. B. Dennis gives an incident coming under his own observation recently in the East which illustrates the strange ups and downs of mining life. Fifteen years ago an acquaintance of his was at the head of a mining company then operating at Leadville. This company did considerable development work and secured patents to a number of claims, but as success did not crown its efforts the stockholders became discouraged and the claims were abandoned.

A short time ago this gentleman received a letter from Leadville, in which he was offered $500 for one of these old claims. That set him to thinking, and he made up his mind to go out to Leadville, take a look over his old stamping ground and see what was up. As a result he discovered that the claim in question adjoined the Little Johnny.

The title to his old claim was in bad shape, and he discovered that it would require $8000 to clear it up. He called a meeting of the stockholders, laid the facts before them, and expressed his willingness to contribute his share of the money necessary to clear the title and develop the property, but when he informed them that $100,000 might be required for development work they declined to undertake the hazard. He then bought them out for small sums and went ahead with the development himself. A short time ago he had a bona fide offer of $1,250,000 for that abandoned mine, and refused it.

It is incidents like this that keep men trailing over the Western mountains from youth to age.

The Inventor.

In a recent address Alexander Siemens said that it is a popular superstition that the inventors are heaven-made, and that they can produce useful novelties to order in any branch of manufacture where a want exists, if only their attention is drawn to it. "The history of the invention of the steam engine," he said, "is a well-known illustration of the point I wish to emphasize. According to the popular version, Watt, a small boy, saw the lid of a teakettle moving up and down, when the water was boiling, and this suggested to him the construction of a steam engine. As a matter of fact, Watt made himself acquainted with what had been done before (a point altogether ignored in the popular version), and had to work very hard before he brought his invention to a successful issue. His example is typical of the true method of progress, and we may generally say that in order to approach a problem with the most certain prospect of success it is necessary:

"1. To define, as accurately as possible, the want that exists, or the particular object that is to be attained.

"2. To be well acquainted with the scientific principles which come into play.

"3. To know how the want is met, or the object attained in practical life.

"4. To find out what proposals have been made by others in the same, or in a similar case.

"A careful attention to these requirements will prevent much disappointment and waste of energy, as will be obvious to all of you without further explanation."

"It is to be noticed," writes a correspondent of *Industries and Iron*, "that the gas press organs become much elated on the occurrence of any small hitch or accident in connection with electric lighting, the account of which is eagerly pounced upon and magnified in every way possible. I think that the electrical papers might, with equal justice and expediency, publish for the benefit of the electric lighting public the accounts of those gas catastrophes which one rarely passes a week without seeing in the papers. I will undertake to say that the accidents in connection with gas, involving loss of life and injury to property, occurring in a month, are more numerous and disastrous than the accidents with electricity in a year. A 'Gas Accident Calendar,' if once entered on, would, in my opinion, rapidly assume imposing dimensions."

A Year's Quicksilver Product.

The estimated production of quicksilver in California for the year 1894 is as follows:

Mine.	*Flasks.*
New Almaden	7,235
Napa Consolidated	4,930
Great Western	5,341
Great Eastern	1,368
Standard	4,214
New Idria	1,005
Ætna Consolidated	3,575
Sulphur Bank	348
Redington	1,209
Other sources	1,354
Product, 1894	30,579
Product, 1893	30,551
Product, 1892	27,993
Product, 1891	22,886

A NEW process of extracting gold from auriferous ores, by means of bromine, is reported elaborated by C. Lorsen. The difficulty hitherto associated with the use of bromine for this purpose has been the obstacle in the way of its recovery, and the process, therefore, has been too expensive for practical use. Herr Lorsen, however, now electrolyzes a solution of potassium bromide, and obtains an alkaline solution which contains hypobromide and bromate, which is capable of dissolving gold. The ore is treated with excess of this solution by rotating cylinders; the solution is then filtered, the gold precipitated by passage over a mixture of iron and coal, and the solution, which now mainly contains potassium bromide, is electrolyzed once more, and again used for extraction.

No. 8

...THE COMET CRUSHER OF

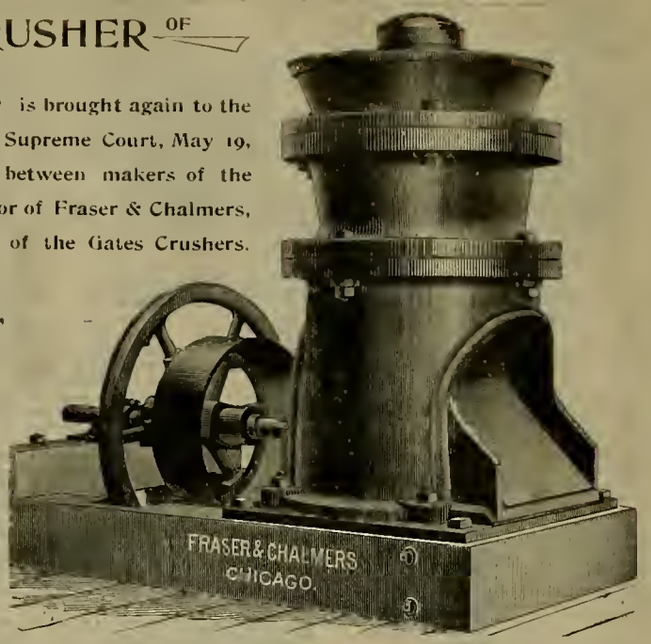
FRASER & CHALMERS is brought again to the FOREGROUND by the decision of the U. S. Supreme Court, May 19, 1894, concluding a long course of litigation between makers of the Gates Crusher and Fraser & Chalmers in favor of Fraser & Chalmers, and all costs and expenses to the makers of the Gates Crushers.

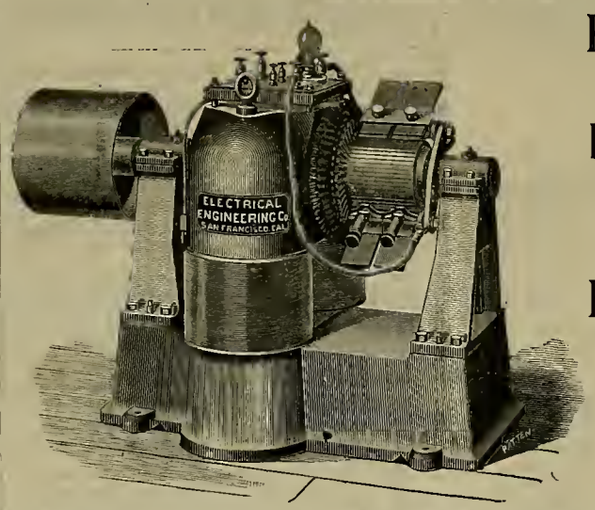
FRASER & CHALMERS,
CHICAGO, ILL., U. S. A.
43 Threadneedle St., E. C., LONDON, ENG.
WORKS AT
CHICAGO, ILL. and ERITH, KENT, ENG.
BRANCH OFFICES:
2 Wall Street, N. Y.; City of Mexico, Mex.; Salt Lake City, Utah; Helena, Montana; 527 17th Street, Denver, Colorado.

MINING AND ORE TREATING MACHINERY OF EVERY DESCRIPTION.

HUNTINGTON CENTRIFUGAL ROLLER MILLS, ROOT'S BLOWERS, SMELTING FURNACES, etc.

RIEDLER PUMPS AND AIR COMPRESSORS
CORLISS ENGINES, BOILERS, ETC.





Electrical Engineering Co.,
MANUFACTURERS OF
Dynamos and Electric Motors
FOR THE TRANSMISSION AND DISTRIBUTION OF POWER
Electric Power Apparatus
FOR
Quartz Mills, Hoisting, Pumping, Drilling,
And all Mining Work where Long Distance Transmission is required,
A SPECIALTY.
OFFICE AND WORKS: 34 and 36 Main Street, San Francisco, Cal.

P. & B. PAINT.
Absolutely Acid and Alkali Proof.
For CHLORINATION WORKS and Preserving Wood and Iron from Acid Attack, Rust or Decay.

P. & B. ROOFING.
Send for Circulars.

PARAFFINE PAINT CO., 116 Battery Street, S. F.
221 South Broadway, Los Angeles, Cal. 49 First St., Portland, Or.

Rand Drill Co.

Rock Drilling, Air Compressing,
Mining and Quarrying
Machinery.
23 Park Place, - - - - New York, U. S. A.
BRANCH OFFICES:
Monadnock Building . . . . . Chicago
Ishpeming . . . . . Michigan
1316 Eighteenth Street . . . . . Denver
Sherbrook P. O. . . . . Canada
Apartado 830 . . . . . City of Mexico

Market Reports.

The Markets.

SAN FRANCISCO, Jan. 31, 1895.

A fraction over 59 was the silver quotation till the 30th, when the 60 mark was again reached. Little if any change is reported in any of the metal quotations, except copper, which shows a small advance.

THE SILVER PRICE, RATIO OF SILVER TO GOLD, AND INTRINSIC VALUE OF THE SILVER DOLLAR, FROM 1851 TO 1894, INCLUSIVE.

Years.	Price of silver, cents.	Ratio of silver to gold.	Intrinsic value of the silver dollar, cents.
1851	133.7	15.46	103.4
1852	132.6	15.59	102.6
1853	134.8	15.33	104.2
1854	134.8	15.33	104.2
1855	134.4	15.38	104.0
1858	134.4	15.38	104.0
1857	135.3	15.27	104.7
1858	134.4	15.38	104.0
1859	136.0	15.19	105.2
1860	135.2	15.29	104.8
1861	133.3	15.50	103.1
1862	134.6	15.35	104.1
1863	134.5	15.37	104.0
1864	134.5	15.37	104.0
1885	133.8	15.44	103.4
1866	133 9	15.43	104.6
1867	132.8	15.57	102.7
1868	132.6	15.59	102.6
1869	132.5	15.60	102.5
1870	133.8	15.57	102.7
1871	132.6	15.57	102.6
1872	132.2	15.63	102.2
1873	130.8	15.92	100.4
1874	127.8	18.17	98.8
1875	124.6	18.59	98.4
1876	115.8	17.88	89.4
1877	120.1	17.22	92.9
1878	115.2	17.94	89.1
1879	112.3	18.40	86.9
1880	114.5	18.05	88.5
1881	113.8	18.16	88.0
1882	113.6	18.19	87.9
1883	111.0	18.64	85 9
1884	111.8	18.57	86.1
1885	106.5	19.41	82.3
1886	99 5	20.78	76.9
1887	97.8	21.13	75 7
1888	94.0	21.99	73.7
1889	93.6	22.10	72.4
1890	104.6	19.77	80.9
1891	98.8	20.92	76.4
1892	87.1	23.72	87.4
1893	78.0	28.49	60.4
1894	60.4	34.25	46.7

New York Metal Market.

NEW YORK, Jan. 31.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.

COPPER—Brokers', 10.05c: exchange, 9.95c.

LEAD—Brokers', $3.02½; exchange, $3.12½.

TIN—Straits, 13.80c; plates, ——c.

SPELTER—Domestic, $3.25.

New York Prices.

NEW YORK, Jan. 24.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Frlday	27⅞	59⅞	10 00	3 00
Saturday	27⅞	59⅝	10 05	3 02½
Monday	27½	59½	.....	.....
Tuesday	27⅜	59⅞	.....	.....
Wednesday	27⅝	60	10 05	3 02
Thursday	27⅞	60	.....	.....

The local bullion, money and exchauge quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by tendsr	7
New York Sight Draft	17½c
New York Telegraphic Transfer	20c
London Bankers' 60 days	$4.89
London Merchants	$4.86
London Sight Bankers	$4.90
Refined Silver, per ounce	60
Mexican Dollars, nominal	49½@50

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdsred, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Sheatbing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	5 50
IRON.			
American Soft	14 00	@	18 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	18
PIG TIN.			
Per lb.	17	@	—
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sbeet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, bard			12 50
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	12 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Bullion M Co, Nev	44	10c	Jan 21, Feb 26, Mar 21	R R Grayson. 331 Pine
Bulwer Con M Co, Cal	10	5c	Dec 11, Jan 16, Feb 15	J E Jacobus, 309 Montgomery
Confidence S M Co, Nev	25	30c	Jan 9, Feb 13, Mar 6	A S Groth, 414 California
Crescent M Co, Cal	1	10c	Jan 15, Feb 16, Mar 11	A K Durbrow, 309 Montgomery
Golden Eagle M Co, Nev	1	15o	Jan 8, Feb 28, Mar 4	E B Holmes, 309 Montgomery
Gould & Curry S M Co, Nev	75	15c	Jan 17, Feb 19, Mar 12	A K Durbrow, 309 Montgomery
Inyo Marble Co, Cal	26	10c	Jan 21, Mar 6, April 5	W W Sargeant, Mills Building
Ophir S M Co, Nevada	64	25c	Dec 10, Jan 14, Feb 4	R B Holmes, 309 Montgomery
Potosi M Co, Nevada	43	25c	Dec 11, Jan 14, Feb 5	C E Elliot, 309 Montgomery
Reed M & M Co, Nev	1	2o	Dec 31, Feb 11, April 3	John H Isham, room 33, Mills Bldg.
Sierra Nevada S M Co, Nev	108	25c	Jan 18, Feb 20, Mar 11	E L Parker. 309 Montgomery

MEETINGS.

Company and Locotion.	Secretary and Office in S. F.	Date.
Con M & M Co	C E Elliot, 309 Montgomery	Feb 6

Mining Share Market.

SAN FRANCISCO, Jan. 31, 1895.

The week was a good one on the street, the market in the main being strong and active. The Con. Cal. & Va. assays show an improvement of $2 per ton. But 653 shares were delinquent at the Savage assessment sale. The Alta mill was started on Monday. Heavy snow in the Sierras in the early part of the week cut off mail communication.

At the annual meeting of the Belcher 71,867 shares were represented and the following officers elected: President, James Newlands; vice-president, A. K. P. Harmon; trustees, J. P. Martin, George D. Edwards, James Newlands Jr, C. L. Perkins was re-elected secretary and W. E. Sharon superintendent. The secretary's financial statement showed a credit December 31st of $2816, with December mining expenses not paid.

During the year 685 tons of ore were worked at the Brunswick mill, which netted $14,929.

The Homestake Mining Company paid a 25-cent dividend on the 25th. Previous dividends were 20 cents a share.

The following illustrates the changes of the week:

MINES.	24	31
Alpha	.....	$ 10
Alta Consolidated	$ 36	39
Andes	36	32
Belcher	48	42
Best & Belcher	90	88
Bodie	88	.....
Bullion	.....	12
Cballenge	32	34
Chollar	39	.....
Confidence	.....	.....
Consolidated California and Virginia	3 45	3 40
Consolidated New York	.....	.....
Crown Point	54	46
Exchequer	04	.....
Gould & Curry	35	34
Hale & Norcross	83	78
Justice	.....	19
Mexican	89	88
Ophir	1 70	1 65
Overman	16	17
Potosi	49	.....
Savage	47	47
Sierra Nevada	48	45
Union	55	53
Utab	.....	05
Yellow Jacket	54	49

San Francisco Stock Board Sales.

SAN FRANCISCO, Jan. 31, 1895.

9:30 A. M. SESSION.

100	Alpha	10	100	Kentuck	04
100	Alta	39	100	Mexican	88
100	Belcher	41	500	Hale & Norcross	75
50	Best & Belcher	88	100	Mexican	86
100	Bullion	12	100	Overman	17
500	Bulwer	15	100	Seg Belcher	11
50	Challenge	34	100	Sierra Nevada	42
200	Con Cal & Va	3 30	50	Union	53
10		3 25	200	Yellow Jacket	49
450	Crown Point	48			

SECOND SESSION—2: 30 P. M.

200	Andes	32	200	Gould & Curry	34
100		31	250		33
50	Belcher	41	500	Hale & Norcross	75
200	Best & Belcher	86	100	Mexican	86
100	Bullion	12	100	Overman	17
500	Bulwer	15	100	Seg Belcher	11
50	Challenge	34	100	Sierra Nevada	42
200	Con Cal & Va	3 30	50	Union	53
100		3 25	200	Yellow Jacket	49
450	Crown Point	48			

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JANUARY 22, 1895.

532,869.—GAS ENGINE—Covey & Haines, Stockton, Cal.

532,959.—CLOSET SEAT, ETC.—F. G. Higb, S. F.

532,898.—BUCKLE—W. A. O'Bar, Everett, Wasb.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

HAIR CLIPPING MACHINE.—Charles W. Babcock, Portland, Or. No. 523,628. Dated Jan. 15, 1895. This invention relates to improvements in hair-clipping machines of that class in which a toothed cutter plate is adapted to be reciprocated over a fixed comb plate. The object of the invention is to provide a machine which can be placed flat upon any part of the head and operated by means of handles without the necessity of any rotary joint to change the position of the clipper with relation to the handles, and to so construct the machine that the plates may be separated from each other, the different parts easily adjusted, taken out or replaced. It consists of the comb plate fixed to one of the pair of bandles, and channels transversely upon the upper surface, a cutter plate, a tongue extending transversely between the cutter and comb plates lying within the channel having its front and rear edges adapted to form a tongue and groove engagement with the cutter plate, and a shank or spindle connecting with the other bandle having a rocker arm fixed to it and engaging the cutter plate.

P. T. Taylor & Co.

Successors to Van Drake & Taylor.

Van Drake & Taylor, general machinists of this city, have dissolved partnership. P. T. Taylor, having purchased the interest of A. J. Van Drake, will continue the business at the old place, No. 523 Mission street. This shop is one of the best equipped on the coast for doing fine and experimental work of all kinds. Inventors will find this an excellent place in which to work out and perfect their ideas, while manufacturers generally will find it advantageous to avail themselves of the fine working machinery in use here. Particularly will this be the case with those having gears to cut, as a new Gould & Eberhardt gear cutter of large capacity is at their service at very moderate rates.

Every Inventor Wants a Good Patent

Or none at all. To secure the best patents Inventors bave only to address DEWEY & Co., Pioneer Patent Agents, No. 220 Market St., San Francisco.

There are many good reasons why Pacific Coast Inventors should patronize this Home Agency.

It is the ablest, largest, best, most convenient, economical and speedy for all Pacific Coast patrons.

It is the oldest on this side of the American continent, most experienced, and in every way reliable.

Conducted from 1863 by its present owners (A. T. Dewey, W. B. Ewer and Geo. H. Strong), this agency has the best knowledge of patents already issued and of the state of the arts in all lines of inventions most common on this coast.

Patents secured in the United States, Canada, Mexico, all British colonies and provinces, England and other civilized countries throughout tbo globe.

Caveats filed, assignments duly preparod, examinations made, and a general Patent Agency business conducted.

Established and successfully and popularly conducted for nearly thirty years, our patrons number many thousands, to whom we refer with confidence, as men of influence and reliability. Old and new inventors are cordially offered tbe complimentary use of our library and free advice, etc. No otber agency can afford Pacific States inventors half the advantages possessed by this old, well-tried and experienced firm.

20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be bad at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

Assessment Notices.

GOULD & CURRY SILVER MINING COMPANY—Location of principal place of business, San Francisco, Cal.; location of works, Virginia, Storey county, Nev.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 17th day of January, 1895, an assessment (No. 75) of fifteen cents (15c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 19th day of February, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the 12th day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

REED MILL AND MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Ferguson Mining District, Helene, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 31st day of December, 1894, an assessment (No. 1) of two (2) cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 33, tenth floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 3d day of April, 1895, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

By order of the Board of Directors.

JOHN H. ISHAM, Secretary.

Office, Room 33, tenth floor, Mills Building, San Francisco, California.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia district, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 21st day of January, 1895, an assessment (No. 44) of 10 cents per share was sold on THURSDAY, the 21st day of March, 1895, levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 21, No. 331 Pine Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of February, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office, Room 21, No. 331 Pino street, San Francisco, California.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California; location of works, Inyo, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 21st day of January, 1895, an assessment (No. 39) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 13, third floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 5th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. W. SARGEANT, Secretary.

Office—Room 13, third floor, Mills Building, San Francisco, California.

DUMBARTON LAND AND IMPROVEMENT COMPANY.—Location of principal place of business, San Francisco, California. Location of works, in the counties of Alameda and Santa Clara, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 22d day of January, 1895, an assessment (No. 7) of 12½ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 214 Pine street, room 55, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on THURSDAY, the 21st day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JABEZ HOWES, Secretary.

Office, Room 55, 214 Pine Street, San Francisco, California.

CLEVELAND RUBBER WORKS
GUARANTEED SUPERIOR IN STRENGTH OF DUCK, FRICTION, PURENESS OF GUM, DURABILITY & FINISH.
STRETCHED
WARRANTED 2-X-L
TRADE MARK
CLEVELAND & O.
WARRANTED NOT TO PEEL, CRACK OPEN AT THE SEAM, NOR SEPARATE BETWEEN PLIES OF DUCK.
OF THE MECHANICAL RUBBER CO.

Simonds Saws and Machine Knives.

Rubber Belting, Rubber Hose, Cotton Hose, Packing.

Leather Belting.

Dodge Wood Split Pulleys.

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Graphite and Graphite Grease.

Covel Belt Hooks.

SIMONDS SAW CO.,

No. 31 Main Street, San Francisco, and 85 First St., Portland, Or.

NEW METHODS. STORAGE BATTERIES. NEW RESULTS.

By the use of illuminating gas for power, in connection with our Batteries, twice the number of lights can be produced than by burning gas direct.

Our Electric Hand Lamp now perfected and ready for the market. Write us or call for full particulars.

EUREKA ELECTRIC CO.,

645 MISSION STREET ..... SAN FRANCISCO, CAL.

Steadily Sinking.

Col. E. J. Corthell, who is now making surveys for a $5,000,000 bridge across the Mississippi, near New Orleans, says that the city is steadily sinking. He says that there is a movement on foot among eminent engineers to have an investigation made into the delta country, with a view to ascertain how much sinking there has been during the last thirty years. It is a fact that the entire delta country is gradually sinking. From a number of bench marks made by surveyors years ago on trees, etc., on the gulf coast, and a comparison of the mean level of the gulf now with what it was twenty years ago, in connection with the present bench marks, the fact has developed that the delta coast has sunken at least a foot in the past thirty or forty years. There is no doubt that the city of New Orleans is some six inches lower now than it was forty years ago. The intention is to ascertain the exact sinking of the earth and to investigate the causes which have produced it.

THE figures show that the two cruisers, the "Cincinnati" and the "Raleigh," which were built by the Government, cost $1,227,565.94 more than contractors offered to build them for. In other words, three cruisers could have been built by contract for what two cost when the Government tried to do its own work, and they could have been completed in less time.

METAL MINING

Mechanics; Mechanical Drawing; Electricity; Architecture; Architectural Drawing and Designing; Masonry; Carpentry and Joinery; Ornamental and Structural Iron Work; Steam Engineering (Stationary, Locomotive or Marine); Railroad Engineering; Bridge Engineering; Municipal Engineering; Plumbing and Heating; Coal Mining; Prospecting, and the English Branches. A blowpipe outfit and case of mineral specimens free to students. Send for Free Circular, stating the subject you wish to study, to

The International Correspondence Schools, SCRANTON, PA.

TAUGHT BY MAIL — THOROUGH — PRACTICAL

The Ideal Steam Oil Refiner

FOR STEAM POWER PLANTS.

The Purity Oil Filter

FOR WATER POWER PLANTS.

Will reclaim your waste oil and make it equal and often better than new oil. Will reduce your oil bills 50 per cent and save your bearings. In use with the largest and best plants everywhere. For prices and particulars, address

D. M. DOUB, 137 First Street, San Francisco, Cal.

RISDON IRON WORKS.

Office and Works: Cor. Beale and Howard Sts., San Francisco.

Cable Address: "RISDON'S" San Francisco.

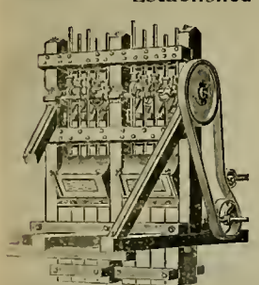
MANUFACTURERS OF

Johnston's Concentrator, Bryan Mills,
Challenge Ore Feeders, Air Compressors,

MINING, MILLING, PUMPING and HOISTING PLANTS.

The Edward P. Allis Company, Milwaukee, Wis.

Established 1860. Reliance Works.



Crushers,
Rolls,
Stamps,
Jigs,
Concentrators,
Screens,

BRANCH OFFICES:

San Francisco, Cal. ..... 31 Main Street.
D. B. HANSON, Manager.

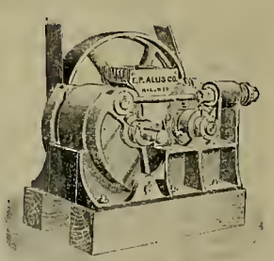
Denver, Col. ..... 1316 Eighteenth Street.
W. H. EMANUEL, Agent.

New York City ..... 26 Cortlandt Street.
F. A. LARKIN, Manager.

Chicago, Ill. ..... 509 Home Ins. Building.
J. B. ALLAN, Manager.

Minneapolis, Minn. ..... 416 Corn Exchange.
J. F. HARRISON, Manager.

Hoists,
Pumps,
Fans,
Compressors,
Boilers,
Etc., Etc.



Reynolds Corliss Engines.

MINING, MILLING AND SMELTING MACHINERY.

UNION IRON WORKS,

CORNER FIRST AND MISSION STREETS, - - - - SAN FRANCISCO, CAL.

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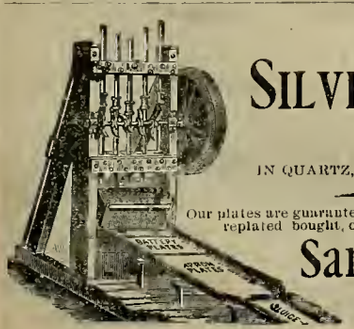

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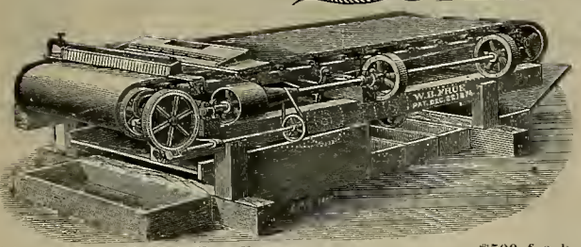

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GLADSTONE MINING COMPANY, FRENCH GULCH, Shasta Co., Cal.,
C. J. Clark, M. E., Gen'l, Supt. Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $3 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill. C. J. CLARK, Gen'l Supt.

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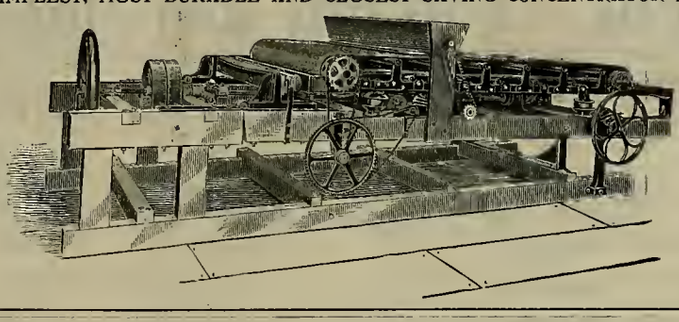
CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.
THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.
Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.
Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * iron West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.
You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily ecommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works.

THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS

was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891. MORE THAN DOUBLE THIS CAPACITY with one-half less power and occupying less than one-half the space of any other concentrator. Built of best Steel and Wrought Iron. Strong and durable. **Price $575 f. o. b.** Send for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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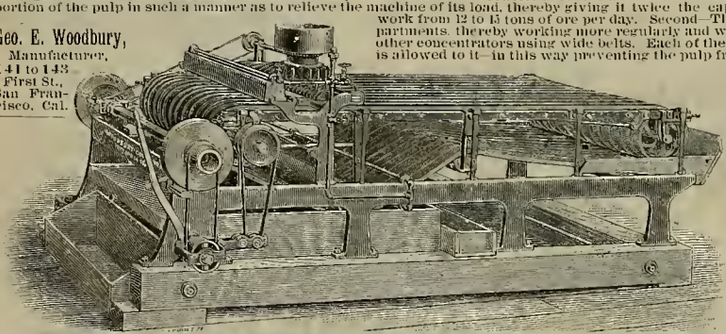

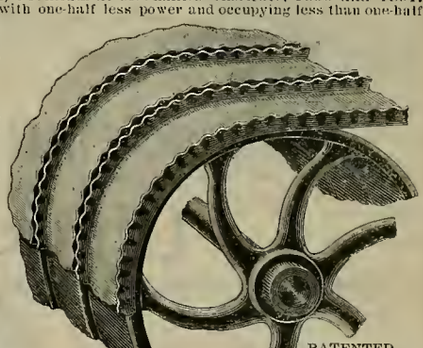

PATENTED, Aug. 18, 1891.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1894.

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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 6. SAN FRANCISCO, SATURDAY, FEBRUARY 9, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

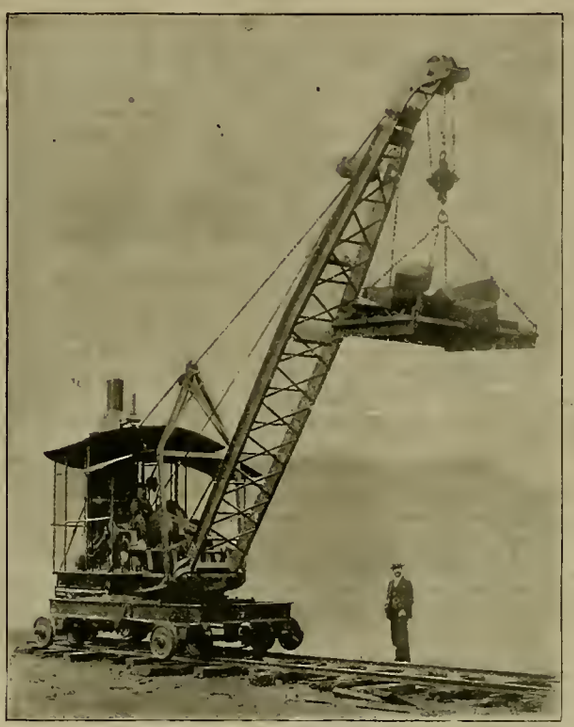
The "Lancaster" Hoister at Rocky Bar, Idaho.

The "Lancaster" combination hoisting machine, shown at work as a steam crane on the accompanying cut, taken from a photograph, is one recently designed and built by James H. Lancaster, 39 and 41 Cortlandt street, New York, for the Bear Creek Alluvial Gold Company of Rocky Bar, Idaho.

It is there used chiefly for raising boulders and rock from the creek fifty feet below the track on which it travels and works. The illustration shows the machine with a load of boulders and rock weighing four tons on a platform six feet square and five feet high.

The boulders are lifted from the creek and then run back on the track 200 feet, swung completely around and automatically dumped by tipping one side of the platform by a chain connected to and operated by the second drum of this double drum hoister.

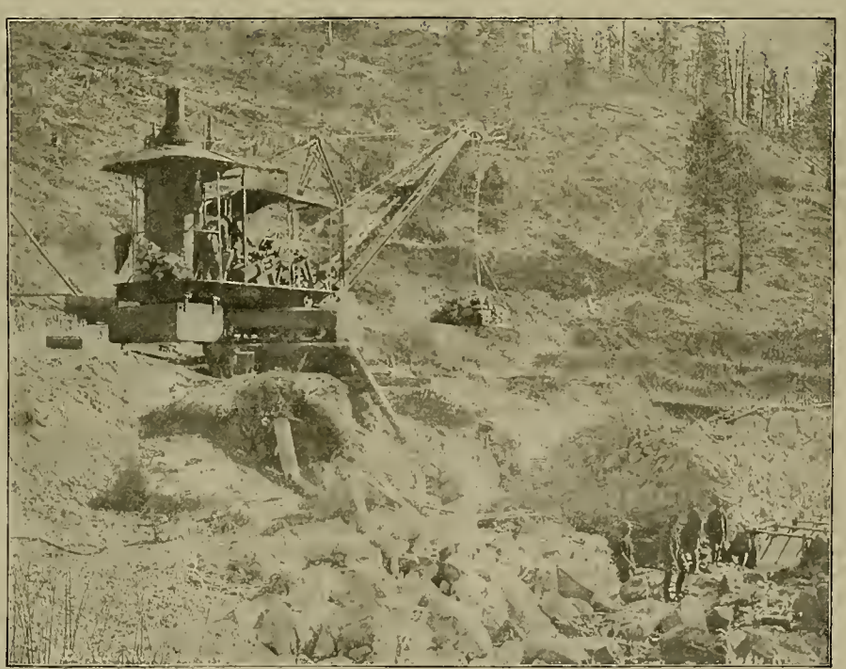
The hoister is self-propelling in both directions on a 4-foot 8½-inch, 8 or 10 foot gauge track, and has eight adjustable traveling wheels to suit the gauge. It rotates the platform carrying the engine, boiler and loaded boom completely around upon a 7-foot 6-inch turntable mounted on the steel truck. The machine travels about four miles an hour, derricks the loaded 30-foot steel boom in and out and swings it around the entire circle in thirty seconds. The swinging or slewing, derricking and traveling motions of the machine are simultaneously operated and independently reversible, and it is so balanced that no perceptible jarring or rocking of the platform occurs while rapidly picking up or dropping the heaviest load at the extreme radius.



THE LANCASTER "1895" HOISTER.
Seven tons' load, thirty-foot boom.

This 1895 combiuation "Lancaster" hoister, handled by one man, automatically works a grapple of 1¼ cubic yards on a 25-foot boom, a 1¼ yard on a 30-foot boom and a 1 cubic yard grapple ou a 35-foot boom, respectively, and makes seven deliveries of a well-filled bucket from a sand, gravel or mud pit thirty feet deep to cars or scows at any point or position within the entire radius every five minutes.

A steam shovel of the "Lancaster" patent steam-actuated, double-speeded construction of 1 or 1¼ cubic yard capacity can also be connected to and be rapidly operated by one man with the same hoister and changed from or to a steam crane, shovel or grapple (clam shell or other style) inside of thirty minutes. This combination machine can also be readily detached from the steel car-frame shown and transferred to and fixed upon the deck of a scow or barge and rapidly operated from it and used either as a crane or for working a grapple or a dipper.



THE "LANCASTER" HOISTER AT ROCKY BAR, IDAHO.

The engines are reversible and set at a slight angle to permit the compact arrangement shown of gears and frictions and the center-pin or steadying post, around which the whole machine rotates. The pair of engine cyliuders are 9 inches in diameter by 12-inch stroke and mounted on a frame. Extension arms or lateral supports are carried at both front and rear ends of the truck, which slide in flush when not in use, aud outwardly as needed up to fourteen feet in width. These four adjustable steadying accessories are available in case of any tendency to tip, when rapidly lifting and swinging excessive loads at a great radius. Winch-heads are placed on each side of the machine for general hauling purposes.

These hoisting and digging machines are also operated in connection with the new "Lancaster" placer gold amalgamator and concentrator which treat low-grade placer diggings, tailings or pulverized ore from either stamp mills or rolls at the rate of one cubic yard and upward a minute, at low cost with a minimum supply of water or compressed air.

A MINER, who owns a three-fourths interest in a claim that he wants patented, writes, saying that the owner of the other one-fourth doesn't want the claim patented and refuses consent. He wants to know the best thing to do. Go ahead, and get your claim patented in the joint name of yourself and the owner of the one-fourth. He may or may not pay his pro rata of the expense, but that is the only way you can get a patent. The Government won't issue a patent for an individual interest and neither you nor it can compel your partner to join you in an application. But he can't prevent you getting a patent in your name and his.

IN a communication in another column, J. E. Bell, of Shasta, emphasizes the fact recently pointed out in these columns that unless prompt and effective action be taken the thus far unpatented mineral lands of the State will be controlled by a trust. The facts have been given in these columns from week to week, our Senators and Congressmen are acquainted with them, a committee in this city is doing all possible to push the people's side of the case, and every reader of the PRESS can aid in the work.

ELSEWHERE "A Miner" voices the sentiment of every mining man in the State in a protest against the proposed transfer of the State Mining Bureau to the State University. His arguments are unanswerable.

MINING has done much for this State, but the State has never done much for mining. All that it is asked to do now is to let matters alone; let the Mining Bureau go on with its preseut good work, and don't cripple intelligent effort by any wrong ideas of "economy." The good of the State should not be made to yield a personal vindictiveness.

MINING AND SCIENTIFIC PRESS.

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J. F. HALLORAN.....General Manager

San Francisco, February 9, 1895.

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THE annual report of the Ontario Mining Bureau is received, containing 200 pages of practical information regarding the mineral wealth of that Dominion. It is to be hoped the Dominion government appreciates the value of the institution, and, unlike the California government, will not have any proffered measures for the annihilation of its Mining Bureau.

A PRESS DISPATCH of the 5th from Sacramento says that Prof. Hilgard, the head of the agricultural department of the University of California, is preparing a bill to abolish the State Mining Bureau. We have the best authority for saying that there is no truth in the statement. Among other sensible attributes of Prof. Hilgard is the capacity for minding his own business.

A BILL passed the Assembly last Monday that will afford some cessation from the harassing of hydraulic miners so common heretofore. As at present, any inadvertent violation of the legal technicalities regarding the disposition of debris is punishable as contempt of court—the assumption being that the miner is a quasi-criminal existing only through sufferance and presumed to be a law-breaker. The bill permits appeal from findings for contempt and gives the hydraulic miners the same equitable rights possessed by other citizens. There were only eighteen opposing votes. Its provisions apply to any citizen of any occupation and permit appeal from findings for contempt not committed in the presence of the court.

THE recent national convention of manufacturers at Cincinnati, Ohio, was well attended. It was unanimously resolved to form a "National Association of Manufacturers of the United States." A second meeting will be held in Philadelphia toward the close of the year. Each State is entitled to five delegates, and one additional delegate for every $50,000,000 output of manufactured product, as appearing in the census of '90. The matter of foreign markets was given wide discussion, the sentiment being that "no matter how much our consumption of various things is compared to the consumption of the same things by the rest of the world, our productive powers outstrip our consumptive demand and we therefore need outside markets."

THE efforts of the committee on the exemption of mineral lands are bearing fruit. Mr. McGee, "Chief of Division F," has seen a great light, and discovers that he cannot continue to be so high-handed in his actions as he started out to be. "Clear List 54" contained nearly 134,000 acres of land calculated to be absorbed by the railway company. It was certified in the General Land Office as having been adjudged agricultural, and the commissioner made a report thereon, recommending approval. Investigation, however, has shown a multitude of mineral surveys and entries in the "clear list," and the Secretary of the Interior has decided that lands embraced in List 54 selected by the Central Pacific railroad, are within a clearly defined mineral belt, and has accordingly postponed the issuance of the patent pending a publication notice.

Statements Versus Facts.

Discussing "The Silver Dollar," the Louisville *Courier-Journal*, to hand, "in a powerful editorial," says:

"The purchasing power of the silver dollar, which is now equal to that of the gold dollar, would be reduced if the present policy of the treasury were abandoned. The different kinds of dollars are kept at a parity by the policy of the treasury department, which gives to the citizen the sort of a dollar he desires. The law requires that a note which calls for coin be paid in either gold or silver at the option of the holder."

The facts are in direct opposition to the statement. The Kentucky editor's zeal in defense of the Kentucky Secretary of the Treasury does not justify such distortion of fact.

The laws of the United States give the treasury department power to redeem notes calling for coin in gold or silver at the option of the Secretary of the Treasury. The holder of the notes has nothing to say in the matter. The Secretary of the Treasury may redeem all such notes presented in silver, if he chooses, and the holder of the note cannot object, nor can he refuse to take silver.

Again Mr. Watterson says:

"Free coinage means the government shall take 371¼ grains of silver, worth about fifty cents, and give a dollar for it."

It means nothing of the kind. Free coinage means that the government shall take 371¼ grains of silver, mix with it 41¼ grains of alloy, put the government stamp on it, and give it back to its owner, the government receiving 41¼ grains of silver as pay for its trouble and the government stamp.

The same article contains a third misstatement. It says:

"The passage of the Sherman act in 1890 put up the price of silver to $1.21 in about a month. Then it began to recede and is now worth from 59 to 60 cents an ounce."

The *Courier-Journal* is as mistaken in its deductions as in its direct statements. As a matter of fact, in 1890 it was thought that a free coinage law would be passed. Under expectation of this the price of silver bullion rose to $1.21. Then, when the Sherman law was passed—as a compromise in place of free coinage—the price gradually declined again. The reason for this is plain.

The Sherman law treated silver as a commodity. Like other commodities its price was governed by the law of supply and demand, and, this being the case, the price of the whole was regulated by the price of the surplus, over and above the 54,000,000 ounces bought each year by the government. This surplus, although small, being excluded from our mints and those of Europe, sold at a low valuation, thus keeping the price of the whole product down.

Tote fair, Brudder Watterson, tote fair. Nothing is gained by misstatement of such patent facts as those discussed.

Sale of a Shasta County Mine.

The Iron Mountain group of mines near Redding was sold last week to a London syndicate, represented by C. W. Fielding, for $300,000. The property comprises 1300 acres, and has yielded silver, gold and copper to the value of over half a million. A. Hill, consulting engineer of the Rio Tinto, who examined and reported on the mine, is quoted as declaring that the Iron Mountain will be worked chiefly for its copper—something new in Shasta county. He considers the Rio Tinto to have been worked 4000 years ago by the Phœnicians. That mine has yielded over $25,000,000 since '85; and though so ancient an opening is only 400 feet deep. Mr. Hill reports it as a huge deposit of sulphide of iron running two and one-half per cent copper, and that the Iron Mountain is the nearest thing like it he has seen in any part of the world.

It is the reported intention of the new owners of the Iron Mountain to displace the twenty-stamp mill now there by a large capacity smelter, treating 1000 tons daily, and employing in all between 800 and 1000 men. The ore of the mine forms a smelting base and the silicious gold ores may be used as a flux.

The proposition is of tangible merit, and the transfer and accompanying activity another instance of profitable investment of foreign capital in California mining enterprises.

A Blow at the Mining Interests.

Not since State Senator Kelley of Solano introduced a bill into the Legislature declaring hydraulic mining in California "a public nuisance" has there been so absurd a proposition affecting the mining interests of this State as State Senator Langford's bill, which is herewith presented in full:

(SENATE BILL NO. 269.)

Introduced by Mr. Langford in the Senate, January 18, 1895. Referred to Committee on Mines, Drainage and Mining Debris.

An Act

To repeal an Act entitled "An Act to Provide for the Establishment and Maintenance of a Mining Bureau," approved April, 1880, and to transfer the museum, library, laboratory and all other property of the State Mining Bureau, together with the fund provided for the maintenance, to the University of California.

The people of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. The Act to provide for the establishment and maintenance of a Mining Bureau, approved April 16, 1880, is hereby repealed.

SECTION 2. The Act supplementary to "An Act to Provide for the Establishment and Maintenance of a Mining Bureau approved April 16, 1880," approved March 21, 1885, is hereby repealed.

SECTION 3. The museum, library, laboratory, and all other property whatsoever of the State Mining Bureau, shall be and is hereby transferred to the custody and care of the Regents of the University of California, to be administered by them for the State of California, as part of said University.

SECTION 4. The Regents of the University of California may, in their administration of the museum, authorize the Department of Geology and Mineralogy of the University of California to carry out any investigations in the field or otherwise which may be deemed necessary for the elucidation of the geology and mineralogy of the State, or to complete the geological and mineralogical history of California.

SECTION 5. For the purpose of maintaining the Museum of Geology and Mineralogy in the city of San Francisco the fund known as the Mining Bureau fund, as described in Section 5 of the Act herein repealed, entitled "An Act for the Establishment and Maintenance of a Miniug Bureau," approved April 16, 1880, is hereby continued in force and shall be known as the "Geological and Mineralogical Fund," and the tax upon certificates of stock corporations shall continue to be levied in the same manner as heretofore, as provided by the Act entitled An Act Imposing a Tax on the Issue of Certificates of Stock Corporations, approved April 1, 1878, and shall be covered into the "Geological and Mineralogical Museum Fund" in the same manner as heretofore it was placed to the credit of the "Mining Bureau Fund" as provided by Section 5 of an Act entitled "An Act to Provide for the Establishment and Maintenance of a Mining Bureau" hereby repealed, and the said "Geological and Mineralogical museum Fund" shall be applied by the Regents of the University of California, to the maintenance and support of the said museum, and to the prosecution of such investigations into the geology and mineralogy of the State as may be authorized by the said Regents.

SECTION 6. This Act shall take effect and be in force immediately after its passage.

A Strong Protest.

The Sundry Civil Service bill contemplates a cessation of part of the regular and necessary work of the U. S. Coast and Geodetic Survey, that would be destructive to the best interests of the work. The present field force is an excellent one; the work being done is important and necessary, and any change in the personnel would be subversive of present requirements. Recognizing this fact, the Geographical Society of the Pacific has forwarded the following protest to the California Congressional delegation:

To the Senators and Representatives of California:—Senators White and Perkins, and Representatives Maguire, Loud, English, Bowers, Geary, Cannon and Caminetti, Washington, D. C.—The council of the Geographical Society of the Pacific has learned with much astonishment that the Sundry Civil Service bill presented to Congress contains estimates which propose a reduction of the field officers of the Coast and Geodetic Survey.

This council knows that a very large part of the triangulation of the combined coasts of California, Oregon and Washington has not been executed. There is more than ten years' work of triangulation and topography for all the available field officers of the survey, with a liberal appropriation each year.

Moreover, the whole coast of Alaska, exceeding *26,000 miles* of shore line, has hardly been touched, except by preliminary work and examination for the pressing demands of navigation. Recent urgent demands have been made for accurate determinations of latitudes and longitudes and measures of triangulation in the Aleutian chain of islands, as a basis for surveys that will give to navigators reliable charts of harbors, headlands, channels and dangers.

No trigonometrical or topographical survey has been inaugurated on the whole outer coast of Alaska, as the base work for hydrography, except a small section connected with the boundary line near Mount St. Elias.

The important chain of the Aleutian islands, the island groups under the peninsula of Alaska, and the outer shores from 50° 40' to the Arctic, are now visited annually by fleets of fur sealers, whalers, traders, fishermen, and by the naval and revenue vessels, and these vessels are, in the main, still using old Russian and English charts, or charts compiled from those authorities with slight additions.

This council therefore urges upon the Senators and Representatives from California the necessity for maintaining the present field force of the Coast and Geodetic Survey, which comprises men of large experience and exceptional skill.

ADOLPH SUTRO,
Mayor of San Francisco.
JAMES F. HOUGHTON.
C. L. TAYLOR.
IRVING M. SCOTT.
RALPH C. HARRISON.
JOHN PARTRIDGE, Secretary.

Concentrates.

THE two mining towns of Grass Valley and Nevada City, Nevada Co., Cal., use 96 telephones.

THE rainfall at the Kennedy mine, Amador Co., foots up nearly thirty-six inches so far this season.

THE Texas mine in Willow valley, near Nevada City, has been bonded by European capitalists, who will develop the property.

AT New Years diggings, Mariposa county, several strikes are reported. Talk is made of stamp mills and kindred improvements.

THE sale of the Golden Wonder mine, near Payson, in Tonto Basin, Arizona, for $40,000 is reported, the buyers being Colorado men.

REPORTS from Montana indicate that hundreds of thousands of dollars worth of mining machinery will be needed in that State this year.

THERE is hardly an unclaimed piece of mining ground left on Elliott creek, Or., now, and that section will be one of the liveliest camps in southern Oregon when spring opens.

THE "Lost Frenchmen" mine near Palomas, in the S. H. mountains, Arizona, has been found again. If it will only stay found, it will be unusual in the annals of lost mines.

FIFTY-FOUR THOUSAND OUNCES of gold were recovered at the Randt and 8000 ounces in other districts; total, 62,000 ounces during December. The November total was 65,000 ounces.

THE silver product of the U. S. in '93 approximated 60,000,000 ounces. It is thought that the aggregate for '94 shows a reduction of about 8,000,000 ounces from that of the preceding year.

THE Austin *Reveille* says Mark Wiggins, and those interested with him, received over $11,000 for the forty or fifty tons of ore recently shipped by them from Kennedy to San Francisco.

IT is said that S. T. Godbe has leased, for two years, all of the Pioche Consolidated property, and active work is soon to be resumed in some of the most important mines, principally the Half Moon group.

LAST Saturday, while retorting 115 ounces of amalgam at the Birney mine, near Angels, the retort exploded, scattering and losing the amalgam and seriously injuring the mill man, Jones, in the eyes and face.

A NEW concentrator, with a capacity of eight tons per day has been put in at Z. A. Moody's quartz mill near Ashland, Or. The ore from the Mattern mine will be run through it when it is ready for business.

THE Gold Nugget Mining Company has incorporated in this city. Directors—G. M. Spencer, H. L. Johnson, John Gamage, John A. Day and E. W. Strange; capital stock $1,000,000. Of this magnificent sum $2500 has been subscribed.

W. S. STRATTON has shipped from his Independence mine in the Cripple Creek district 100 tons of ore, which is expected to yield $1,000,000 at the Denver smelter. Some of the ore is rich tellurium, which runs $30,000 in gold per ton.

IN the Broken Hill Proprietary for the week ended Jan. 3d, 10,274 tons of ore were treated, yielding 858 tons of lead, containing 226,016 ounces silver; also 863 tons treated by amalgamating and leaching plants, producing 10,107 ounces silver.

THE San Diego *Union* is authority for the statement that within seventeen miles of that city there is a gold mine with a fine quartz ledge twenty feet wide, the ore of which runs from $16 to $25 per ton. That, if so, is worth development.

THE Tiger-Poorman mines on Canyon creek in the Cœur d'Alene are reported sold to an English company which has capitalized the property for $1,850,000. The mines have been large and profitable producers, since their first location nearly ten years ago.

THREE years ago, says the *Mining Industry*, every promoter in Denver advised investors to let mining alone and touch nothing but real estate. Investors got the worst of it. Now the whole crowd are working the mining racket as the only good thing. They are correct this time.

THE official statement showing that the net proceeds of the Midwinter Fair amount to over $32,000 causes the Grass Valley *Telegraph* to reflect that the managers could have well afforded to give to Nevada county a gold medal instead of the bronze one for her fine mineral exhibit at the Fair.

A BILL in the Montana Legislature fixes a standard of water measurement and the equivalent of a miner's inch. A cubic foot of water, 7.48 gallons, is declared the legal standard of measurement. One hundred miner's inches are equivalent to a flow of 2½ cubic feet, 18.7 gallons per second.

A NEW 30-stamp mill is to be built at the Silver Peak mine, Walker Lake district, Nevada, and in a few months the forty stamps now at Gold Mountain are to be added. Two steam traction engines of 100 tons capacity each will haul ore from the mine to the mill. The first $100,000 of the $500,000 purchase price has been paid.

IT is reported at Cornucopia, Or., that the O. G. M. Co.'s 100-stamp quartz mill is in danger of collapsing from the enormous weight of snow now lying upon its roof. Snow is between seven and eight feet deep there. It is customary to remove the snow as fast as it falls, but this winter, the property being in litigation, the matter has been neglected.

THE suggestion is made that the miners of California adopt a plan followed in Colorado, where each miner pays $1 per month, which amount is used in the maintenance of a hospital for the treatment of all who are injured while at work. The plan is already in force in a limited manner by several of the mines in the Grass Valley district.

A COMPANY with a million dollars' capital was incorporated in Omaha last week to work the recently discovered grindstone deposits at Edgemont, S. D. Five hundred men will be employed at the quarries. The deposit is said to be inexhaustible and the enterprise is expected to prevent further importations of Bavarian grindstone into the United States.

IN the February *Forum* A. S. Heidelbach explains "Why Gold is Exported." He says it is because "disgust of foreign investors because of recent developments in our railroad management; dismay at the condition of the Treasury and our currency, and the fear that if they invest money here they may not be able to get back as good money as they gave. He says that no change in this state of affairs may be expected until the Government goes out of the banking business and we have a more elastic currency."

THE Shasta *Courier* says more snow is stacked up in the mountains than has been known since 1861, and when the spring rains and thaws come there will probably be considerable damage to property by rushing floods. The deposit on Mt. Shasta and all the country about its base is the deepest known for years, and when the snow melts in the spring the Sacramento and McCloud will boom.

THE *Idaho Avalanche* recently announced a "popular mine" scheme, a prize to go to the mine having the most votes in its favor for the productive quality of the mine, its management, method of working, ventilation, and general advantages. The best mine in the camp got one vote, and a "mine" that has never produced a pound of ore got 165. At this juncture the *Avalanche* disgustedly announced the contest off.

IT is reported in Grass Valley that the Osborn Hill Co. has bought the Orleans mine for $100,000; that there will be no spot cash payment, but the Orleans Co. will receive $50,000 at the end of the first year and the other $50,000 at the end of the second year, with an additional ten per cent of the net revenue from the Orleans mine during the term for which payments are pending.

THE recent closing of the Everett, Wash., smelter, is the unsatisfactory outcome of a $3,000,000 investment by Standard Oil millionaires in it and the Monte Christo gold quartz mines, which proved too rebellious even as a smelting proposition. Mr. W. E. Everette, of Tacoma, long since reported adversely on the proposition, but an Eastern expert reported favorably, the investment resulting therefrom.

IN compliance with the request of Representative Caminetti, who has a bill pending to classify mineral lands, the Secretary of the Interior has sent the railroad land list No. 54, embracing 130,000 acres of Central Pacific selections in El Dorado, Placer and Nevada counties, to the local office to be posted for twenty days, so that contestants shall have notice and may file any protest alleging mineral in any of these lands.

THE Zantgraf mine, in El Dorado county, was sold last week to a company of Chicago men known as Eggleston, Mollett & Co., for $100,000. The new company will take charge immediately and will put in a twenty-stamp mill and improved machinery. Work was begun last week at the mine, and it is proposed to sink a main shaft 200 feet and run drift levels of 100 feet each.

THE Clipper Creek, Col., *Times* says that an entirely new manner of treating ores has been found at a cost that is simply nominal. The *Times* suggests that it may be a little too early to become enthusiastic over the process, but "a few of the very best men in the county are convinced that the method is all that the inventor claims for it. Should present hopes be realized, where there is one miner working now there will be twenty within a year."

FROM a private letter to a well-known resident of Butte, the *Mining and Railway Review* learns that Montana mining properties are in great disfavor in London, caused, it is said, to a large extent, by misrepresentation. Mining brokers and middlemen too often greatly exaggerate the value of their claims, which nearly always results not alone in the loss of a sale, but queers the operator with the speculator. Montana properties are all right and do not deserve the restriction above noted.

IT is not many years since there were no places on the globe less immediately connected in trade than South America and California. Now it is a familiar sight among the Andes to see a pack train. Each donkey bears a load of two packages, each of which contains forty gallons of the wine of California, which is growing constantly more popular in the interior of the continent. The animal so laden can climb the mountains with ease, and the distribution is thus readily effected to distant points.

IN a letter from Paris, Wm. H. Townsend says: "There is now a considerable boom here in Paris, in London and in Berlin in gold mines. At present it is confined entirely to South Africa, but I believe that before midsummer it will extend so as to take in the newer gold districts of the United States. The center of the movement is in London, but Paris is rapidly warming up and Berlin is just beginning. During the last four months the Frenchmen have sent over 200,000,000 francs to London for the purchase of mining shares."

THERE is a big party of men prospecting for a lost mine in the Pinacate mountains on the coast along the gulf of Sonora. The head of the party is Mr. Brewster of San Diego, the builder of the Brewster house there. He has forty burros and eleven mules, with provisions enough to last for months. He has been in that country with his outfit since last October, and expects to remain for several months yet before giving up his search. If success attends this expedition it will have broken the record, for who ever heard of a lost mine being found?

IN his decision in the case of Dibble vs. the Castle Chief Mining Company et al., Judge Gardner of South Dakota, facetiously says: "For the purpose of enabling myself to more intelligently weigh the testimony in the case I have visited the premises in controversy. And while there is much testimony to show that the value of the labor performed on each of said claims for the year 1892 exceeded $100, since inspecting said claims I am quite clearly of the opinion that if said testimony is true, the labor of miners at that time commanded a much higher compensation than does the labor of lawyers or circuit judges."

A PUZZLE is unconsciously furnished by an Arizona prospector, in a mining location sent to the recorder. The dimensions read as follows: "Commeneing at a monument of stones, being the center of the S. E. end of claim; thence E. 300 feet; thence W. 300 feet; thence N. W. 1500, being the center of N. W. end of claim; thence S. E. 300 feet; thence N. W. 300 feet; thence S. E. 1500 feet to place of beginning." The conundrum is, How much land does he locate? This may be learned by taking a piece of paper and making in their proper position the points north, east, south and west; and then following out the directions given by the location notice.

M. GRADY, the discoverer of the group of mines on "Four Mile," B. C., which bear his name, is reported to have said the Alpha and Black Bear claims, which were sold to Seattle capitalists fifteen months ago for $70,000, were being successfully worked by the new company, and that the former mine had already yielded 800 or 900 tons of ore which ran about 120 ounces per ton. He and his partners had still the freehold of five other similar claims. Several rich finds had been made during the past year at Four, Eight and Ten Mile creeks on Slocan lake, the ore containing a good deal of ruby and natural silver. Some gold-bearing ledges, containing from $40 to $300 to the ton, were discovered near the foot of the lake. The find, however, was made late in the fall and the claims have not yet been developed.

FROM Omaha comes a fairy story of a wonderful gold mine near Bannock, Montana. The legend is as follows: Many years ago P. Vandervoot, J. M. Thurston, of Omaha, and R. A. Alger of Detroit, grubstaked a prospector. Several claims were located which assayed rich in gold. Since they were located the title has been kept good by filing certificates and by the performance of assessment work. A mining engineer made a report from an investigation he had made that the property will open up an enormous vein of mineral. The ore is sulphide with quartz which carries heavily in gold. It is free milling and can be handled easily. The ore is a network of veins and covers 300 acres. The gold belt is about fifteen miles wide and twenty-five long. A stock company has already been formed, of which Alger is president and Thurston is vice-president, and active development will commence immediately.

THE Marysville Tunnel and Quartz Co. has a claim on the Yuba river opposite Timbuctoo, extending two miles up to the mouth of Deer creek, embracing the Narrows and the old dumping grounds or tailings from the hydraulic mines in the vicinity of Smartsville. The difficulty in successfully working the mine heretofore has been the handling of the inflow of water, but arrangements are now under way and nearly completed for a plant of machinery of sufficient capacity to handle any amount of water that may flow into the works by percolation or otherwise. It is the intention of the company to go down to the original bedrock of the river. The Yuba river is claimed and operated under the United States mining laws, by various companies, for a continuous stretch of more than twenty miles, many of them meeting with flattering success, the result of which has been to create quite an excitement in river mining and to turn the attention of capital in that direction. No doubt the gold is there in abundant quantities and all that is required is the application of capital and skill to possess it.

THE Good Hope Mining Company will apply another method to the Colorado river bars. Thousands of dollars have been spent in pumping plants for these placers, and, although the gravel was rich in gold, it could not be worked at a profit. The Good Hope Company will use the old irrigation wheel method of raising water, but instead of placing stationary wheels on the bank of the stream they will be operated on boats. The barges will be used fastened together, with enough space between to permit the operation of the wheels. Two wheels, with a diameter of thirty-two feet, will revolve between the barges, the shaft running across from one boat to the other. Each wheel will have twenty-two arms, and to each arm will be fastened a ten-gallon bucket. The wheels will be revolved by the force of the current and the buckets be emptied when they are turned over at the top. It is claimed that the water can easily be raised to the height of twenty-eight feet, which will be sufficient to reach the whole bar. It is estimated that the Good Hope bar contains from 3,000,000 to 5,000,000 cubic yards of gravel, yielding from 60 cents to $2 per yard. Two of the above described wheels, it is said, will wash from 700 to 1000 yards per day, and can be operated by three or four men.

"Why Are Good Mines for Sale?"—The semi-monthly bulletin of the Colorado Gold Mines Investment Company asks this question and then proceeds to answer it by telling why owners of good properties are often eager to sell. It says: "The answer may be found in a simple statement of fact. In a great many instances the owners are men whose lives have been spent in poverty and a daily struggle for existence. They know they have a fortune; they have had enough of battle and strife. They want to enjoy life. They have dreamed of a 'good time,' and they want to realize their dreams. The man, no matter whether young or old, who never before had a dollar, who suddenly finds himself the owner of property worth many thousands, has an uncontrollable desire to see his fortune in shining gold or crisp bank notes. He wants to take life easy. He wants to move out of a miner's cabin into a home provided with the luxuries of life and he doesn't want to wait. He has not been wealthy long enough to want more. He feels that he never will want more, but what he has in the way of property he wants to convert at once into cash. It may be added that there are now many prospectors climbing the mountain sides, searching for gold, who have owned great mines, sold them and wasted their fortunes having a good time."

Personal.

MR. WISHART has assumed the superintendency of the Rose Hill mine at Grass Valley.

CLARENCE KING is inspecting mines at Colville, Wash. From there he goes to Mexico.

F. W. MEDLIN is the new superintendent of the Eureka mine at West Point, Calaveras Co.

A. & C. MALTMAN AND J. MCKEON have gone to Gold Valley, Sierra Co., to start the Empire mine chlorination works.

DR. BOYSON is in the city. Rumor credits him with an intention to turn the management of the Pioneer mine at Plymouth into a stock company.

A. S. SMITH leaves this week for the Philippine Islands, where he will superintend a 100-stamp mill, now building by English gold mine owners there.

RALPH NICHOLS, superintendent of the Sutro Tunnel at Virginia City, will resign the first of next month and go to De Lamar, Lincoln Co., Nevada, where he will be superintendent of the DeLamar mines and mills.

ROBERT LAIDLAW, president of the Laidlaw-Dunn-Gordon Pump Co. of Cincinnati, was elected treasurer of the National Association of Manufacturers, which convened at Cincinnati the third week in January. Mr. Laidlaw was one of the leading spirits in organizing the association, and much of the success of the convention was due to his superior executive skill and untiring energy. The delegation was banqueted at the new plant of the Laidlaw-Dunn-Gordon Pump Co.

An Impending Danger.

To the Editor:—If this coutroversy as to what is mineral and what is agricultural land is continued much longer it will be useless, as the railroad company will have all the mineral land patented and sold. There are uow 600 sections being patented through the Redding Land Office. An examination would show a small part of this land to be agricultural. All railroad land in their grant to the Oregon line, whether mineral or nou-mieral land, is mortgaged to a Loan and Trust Co. in New York city, and there is every reason to believe that it is being patented for them; if so, there will be three or four thousand square miles of the richest mineral land in California owned by a trust company.

There is proof that the Land Department is going to give patents to all lands on the Oregon railroad whether mineral or not. Two years ago the writer was one of several parties who filed a complaint before the Land Department at Washiugton, accompanying the same with maps and affidavits in regard to the mineral character of the laud in the railroad grant from Middle Creek station in Shasta county to the Oregon State line. This complaint includes land 100 miles long by 60 miles wide, including railroad indemnity land. Affidavits were made to these facts, and they are just as true uow as they were then, viz: That there were uot forty acres of agricultural land, not already taken, in the entire tract; that there is not more than one acre in 10,000 that is agricultural; that all of the laud was more valuable for mineral than for agriculture; that it was well-known mineral land and had been known as such for thirty years.

These facts were embodied in the complaint sent, with a request that they be investigated, and, if the affidavits were found to be true, that the laud be declared mineral. After a time a long answer was received, which was in substance as follows: Complaint received, filed, investigated, and dismissed for the reason that there are uon-mineral affidavits on the land referred to. So we find that this mountainous country, rich in gold, silver, copper and quicksilver is covered by nou-mineral affidavits and can be patented as farming land! Who made those affidavits? What men perjured themselves for this corporation? is a secret that the Land Department is strictly guarding.

Orders have been received at the Redding Land Office to cancel all mineral affidavits. No notice will be given the miners who filed them before patent is issued to the railroad company. Most of the producing mines of Shasta county, on odd sections, have first been purchased from the railroad company and then patented from the Government.

If the Caminetti bill, now before Congress, to appoint commissioners to classify mineral aud agricultural land fails to pass, or if passed and the commissioners fail to do their duty, every odd section of mineral land in this State will be owued by a trust.

This commission should consist of one practical miner who understauds quartz and placer mining and is trained in prospecting for mineral, one farmer and one lawyer, and selected from the three political parties. Unless there is great care taken in selecting these men, California will have auother "special" commission as useless as the past Railroad Commission.

All the railroad land from Reddiug to the Oregon line is being listed for patent regardless of mineral land. If Congress adjourns without assisting the miners, this land will be lost to them.

The attention of the legislators should be called to this grab. The miners want the land examined, and it will be found to be mineral and not such land as the railroad is entitled to. To enter contest before the Land Office is hopeless, as the miner is compelled to prove the existence of mineral in paying quantities on each and every one of the smallest legal subdivisions. The magnitude of this steal cannot be estimated. Millions of dollars will be taken out of these mountains every year, if they are open to exploration and possession by the miner.

The attention of our members in Congress and our Senators should be called to this injustice.

The scheme is to have a trust own and control the mineral land of California, as that is about the only industry not controlled in that way. As to the rulings of the United States Land Department, the less the miners have of them the better, as each succeeding one only increases the difficulties of the miner.

Give the miners the Caminetti bill and these classifying commissioners not appointed by a political "pull," and they will get justice. J. E. Bell.

Shasta, Feb 4, 1895.

At the Mausfield copper mines in Germany, immense reservoirs for compressed air are cut out of the rock, near the machinery to be operated thereby, and lined with cement. There are eight of these receivers, from 1235 to 3950 cubic feet capacity. A rock chamber of 2200 cubic feet capacity costs, it is stated, only one-third as much as an iron receiver of equal size.

An Earnest Protest.

To the Editor:—The sentiments you expressed iu the last issue of the Press in regard to the proposed transfer of the State Mining Bureau to the State University at Berkeley are just those of every miner who has had an opportunity of experienciug the benefits of the Bureau, which has now become the source to which we look for instruction and information and has in fact become the educator of the miner. It is as you say the only represeutative institution of the miners of the State.

I have met with the reports and bulletins issued by it in every miuiug camp in my travels, and their well-worn pages illustrate the interest with which they have been read, as they have been passed from hand to haud aud have served to teach the wielders of the pick and shovel much that was useful and beneficial in their work.

During the past two months, while passing a period of iuactivity in the city awaiting the advent of spring to permit of the resumption of work on my miuing property, I have resorted to the Mining Bureau on Fourth street, where I have had resource to its file of mining papers and library of valuable books, aud reaped benefit and instruction that will be of great use to me in the future. I meet at the Bureau many miners, like myself, in pursuit of information, freely given, and experience the utmost courtesy and attention.

Aside from its valuable reports, the bulletins issued on "Methods of Mining Timbering," "Locatiou of Mines," instructing the miner how to take up claims, etc., the bulletin ou "Gas and Petroleum," and the last and most valuable pamphlet on the "Cyanide Process," which gives information long sought and never before obtainable. The eagerness with which these reports and bulletins are sought for is illustrated by the hundreds of people interested in mining calling to obtain them. Again, it is not only those who call at the Bureau, but the hundreds of applications by letter from miners in the interior. Copies of the reports and bulletins are sent to every mining superintendent throughout the State and are gratefully received.

The idea of transferring the Bureau in part, or as a whole, to the State University is tantamount to its entire wiping out, for how many miners seeking information from its books or orally would go to Berkeley or to the Park to study the mineral exhibit and compare the character of its ores as an educator?

The scheme is absurd, so far as the Bureau ever being of any further use to the miners of the State is concerned. Again, on the score of economy, a staff of experts must be engaged all the same and paid all the same, for it is ridiculous to suppose there is any material at the University to do this duty. Where has it had its experience? The idea of its being converted into an instructor to the students is equally absurd. Of what value would the examination of a mine by one of the University students be to the miner or investor? It would be placing the whole objects of the Bureau out of reach of the miner to remove either its library or its mineral exhibit from the city; and as a miner, and as I believe expressing the views of the mauy thousand miners of the State, I protest against the removal of this our only school of instruction, and, if done, will arouse the indignation of this class of men who are the source of the prosperity of the country. Our views would be unmistakably expressed at the ballot box when the names of our representatives who vote for it come again before the people for their suffrage.

We as miners are entitled to recognition aud demand that our interests shall not be trifled with on this miserable plea of economy, when ten times the cost of sustaining the Mining Bureau can be saved in doing away with useless institutions that *are* useless. The Mining Bureau is not one of them.

San Francisco, Feb. 4, 1895. A Miner.

Mineral Resources and Industry of Corea.

Written for the Mining and Scientific Press by I. B. Storch, M. E.

Very few of our California miners are acquainted with the fact that Corea is a rich mineral country and waitiug for its development, which is but a question of time, pending on the conclusion of the present war. Rock salt, iron, copper, silver, gold and coal are the mineral resources discovered to date, but mining is limited to gold, gravel washing on small scale, and iron ore, while copper and tin are imported from Japan. Tin is used for coining and household utensils.

The Government taxes received from gravel mining are estimated to be about $15,000 per annum.

The mint of Corea was constructed by German engineers some time ago. It cousists of the latest modern aud complete machinery for coining silver dollars, but is not in operation—they seem to prefer the old primitive straw-covered institution, which is kept in full blast all the time coining the current "cashs" or "sapasks." The coin is round, $\frac{7}{16}$ to $\frac{13}{16}$ inch diameter, with a hole in its center $\frac{1}{16}$ to $\frac{5}{16}$ inch square, strung on a thread and worth about $\frac{1}{10}$ of our cent.

In the mouutain range Shanalin or Tshangpeshan, dividing Corea from Manchooria and running almost uorth and south through the whole peninsula, the prospector will meet with a rough climate between latitude 34° to 43° uorth. The southwesterly slope is favored with a fine climate, where semi-tropical products are raised, such as cotton, tobacco, rice, sesam, ricinos, black and chili pepper. The means of transportation in the iuterior are poor. There is only one wagon road from Seoul to the China line, used for ox carts; the commuuication with the rest of the country takes place by trails and pack animals. The interior trade is almost entirely in the hands of wandering peddlers.

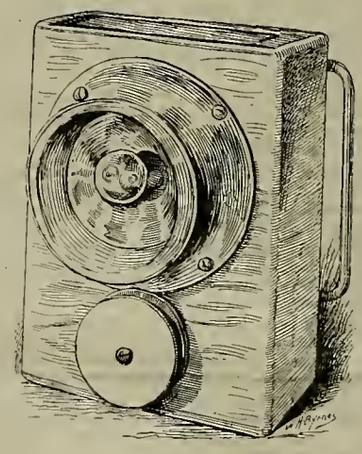
Manufacturing is yet in its infancy, except strawware and paper. The latter is of incomparable quality and made of hemp and wild silk. It is much superior to the Japanese fabricate. Fine and durable blanquetts, water-proof coats, umbrellas, etc., are made of this paper by saturatiug with oil.

Corea will open a great field to enterprising industry and mining within a short time.

Eureka Company's Portable Electric Lamp.

This lamp consists of an outside metal case, nickel plated and fitted with a switch on the handle.

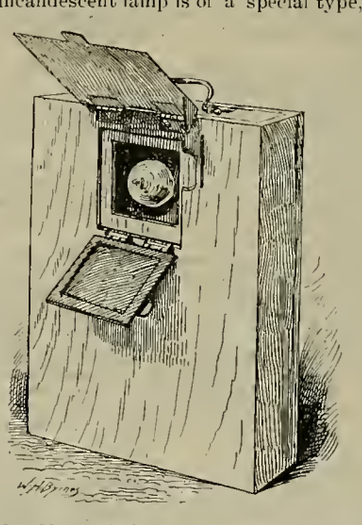
The battery is of the "Hough" type and gives an electro-motive force of six volts. The capacity (useful) in ampere hours is four. The cells are well



INCANDESCENT NIGHT LAMP.

sealed and fitted with hard rubber valves, which, although allowing the gas formed in changing the plates to escape, effectually prevent leakage of acid.

The incandescent lamp is of a special type, and is



PHOTOGRAPHERS' INCANDESCENT LAMP.

so construeted as to take a current of .5 ampere—which therefore gives a run of eight hours or thereabout.

The manufacturers issue a suitable primary battery which, with one charge of the chemicals, will recharge the lamp battery some tweuty or twenty-five times.

All wires and terminals are marked in such a manner that no mistake cau possibly happen in making the necessary connections between the lamp and primary battery.

The total production of copper in the United States in 1894 was 159,623 tons, against 142,480 tons iu 1893—a gain of twelve per cent. The total exports from this country in 1894 were 76,297 agaiust 80,392 tons in 1893.

The Refining of Gold Sulphides

Produced by the Precipitation of Gold from Chlorine or Bromine Solution with Sulphurous Acid and Hydrogen Sulphide.*

By WERNER LANGGUTH, Portland, Oregon.

Since the introduction of the improved method of precipitating gold from chlorine solution SO_2 and H_2S at the Golden Reward Chlorination Works, Deadwood, S. D., this modern method has been further adopted in the chlorination works of the Portland Consolidated Company at Deadwood, and in those of the Black Hills Mining and Smelting Company at Rapid City, S. D. It has proved practically most successful in the handling of large quantities of gold solution, and constitutes up to date, with Mr. John E. Rothwell's most important improvement — namely, barrel leaching under hydraulic pressure — the principal progress made in gold chlorination.

The method of refining the gold sulphides which result from this method of precipitation was introduced by me in 1890 at the Golden Reward Works, and in 1892 at those of the Black Hills Company. It has not suffered any changes during the last three years, and is substantially as described below:

The gold sulphides collected are dried already as far as practicable in the filter press by passing compressed air through them, and are then transferred (care being taken to avoid loss in handling) to light sheet-iron pans, twenty inches wide, thirty-six inches long and four inches high. Precipitate and filter cloth are kept separate as much as possible. If dried well in the press, the precipitate is easily detached from the filter cloth in pretty hard black-brown cakes. The pans, with precipitate and filter cloth, are now introduced into the muffles of the roasting furnace. In the latter plant, constructed by the writer in 1892 for the Black Hills Company, the roasting pans are two by four feet in area, with sides four inches high. The melting furnace is round, and three feet in diameter. At these works the dried precipitate and the filter cloth are transferred to the open cast-iron pans; the muffle is done away with, and the furnace is, in consequence, much simplified. Here the roasting gases escape by the telescope-shaped stack or gas catcher through the roof. The gas catcher is balanced by counter-weights. Its lower part is enlarged, and is lowered to about four inches from the top of the roasting pans as soon as the furnace has been charged, to allow sufficient free access of air from all sides. If the draft is too strong, the gas catcher is moved higher, and can thus be regulated to get the best condition for roasting. When the muffle or roasting pans are charged, the heat in the furnace is kept gentle at first to drive off the moisture, and is raised little by little to a dark red heat. Sulphur, arsenic and antimony are oxidized and driven off, and the filter cloth quickly burns to ashes when detached from the precipitate. The whole treatment of a charge can be conducted within two or three hours. The mass now invariably presents a red brown or yellow appearance, and only a very small percentage of arsenic and sulphur ought to be left. Some care has to be exercised, during the whole operation of roasting, not to lose any of the fine precipitate. The draft must be well regulated and stirring almost completely avoided. Steam drying before roasting is unnecessary, and only adds to cost and labor.

When sufficiently cooled, the roasted sulphides are carefully transferred by means of a hand scoop and brush from the muffle or the pans into the pulverizing drum, a cylindrical sheet-iron barrel, three feet in diameter and four feet long, running on trunnions, provided with an airtight manhole, and revolved by means of a crank or pulley. Some good-sized cobble stones put into it greatly assist pulverization. A little borax, soda and niter is now added, according to the composition of the sulphides. Sometimes the solution from leaching has not been quite clear, and a perceptible amount of slimes (ore) has accumulated with the sulphides in the precipitating tank; or the roasting before chlorination has not been as thorough as it might have been, and considerable quantities of arsenic and antimony have gone into solution with the gold in chlorination, and have been precipitated with SO_2 and H_2S, and not all eliminated in roasting the sulphides. All such circumstances have to be considered, and the necessary fluxes added, to secure a fusible slag of light specific gravity that will render possible the collection of the gold and a clear slag. If the ore treated in this mill is siliceous, the flux will have to be in general an alkaline one, such as soda, potash, etc. If, on the contrary, the ore is a basic one, a siliceous flux, such as glass or sand, etc., has to be added. If sulphur, arsenic or antimony has remained, niter or metallic iron may be added. Niter, however, must always be employed with caution, as it occasions violent action during fusion. As the conditions are always varying, the fluxing in each case has to be left to the discretion of the chemist or manipulator. The fluxes are added direct to the sulphides in the pulverizing drum, and become well mixed during pulverization. They should, at all times, be perfectly dry. Moisture in the flux, anywhere, will surely occasion loss during fusion, gold being carried away in the form of fine dust with the steam out of the crucible. Borax glass is to be recommended instead of common crystallized borax. The pulverizing drum has proved to be the very best machine for this purpose; since, if it is carefully closed, no dusting and consequent loss are experienced.

The gold is now metallic, being reduced by heat in roasting Au_2S_3 + heat = 2Au + 3S, and $3S + 6O = 3SO_2$. In melting the fluxed and roasted sulphides a crucible of good capacity, and yet easily handled, is of great importance. No. 100, Dixon's plumbago, has proved a suitable size. A little borax glass or slag is first put into the crucibles, each of which is filled to about two to four inches from the top, and a covering is given of borax glass or rich slag from previous meltings, which will prevent loss by dusting while the contents are fusing. The crucibles are now placed in the furnaces with the assistance of a pair of blocks and tackles and a basket tongs. A lid is placed on the crucible, and the steadily increasing temperature soon fuses the contents without any boiling or violent action. After fusion the heat has to be kept at very high temperature for some time to effect a complete collection of the smaller gold globules. The crucible is then taken out and quickly poured into a conical mold of suitable capacity.

The bullion separates from the slag in conical buttons. Each crucible melt of good sulphides produces from 100 to 150 ounces of bullion, from .800 to .950 fine. Arsenic, antimony, copper, platinum and silver are the principal impurities. The buttons are remelted, as usual, and cast into a bullion mold to be ready for shipment. The resulting slags are still comparatively rich in gold. They are crushed and pulverized, and the gold shots are panned out and added to the next melting. The tailings from this panning are dried and mixed with the slags of assays from the assay office, or other lead-containing substances. Metallic iron is added, and the mixture is melted in crucibles which have served for sulphide meltings a good many times already, but are considered not any longer quite as sound as is desired for this most important operation. The resulting lead bullion is cupelled, yielding the remainder of the gold. The slags resulting from this second melting are too poor to be rehandled.

The losses in refining by this method are almost entirely mechanical, and depend, therefore, to a great extent on the care and skill of the operator. The flue dust from the roasting as well as the melting furnaces has been assayed at different times after continued operations, but has shown comparatively little gold. There is, of course, some loss by volatilization in melting, but it is small, and only noticeable when arsenic or antimony is present in large quantity. I have once observed on the iron cover of the melting furnace a white sublimate of arsenic, which showed in some places a beautiful pink color. Some of this pink sublimate was carefully gathered and assayed, and proved to contain considerable gold. Experience has shown me that this loss only occurs at very high temperatures (above the melting point of gold) and in the presence of a large percentage of volatile metals, such as arsenic and antimony, and can be avoided altogether by careful roasting and fluxing.

The chemical fact that bromine dissolves and extracts gold from ores is in itself nothing new, but that several thousand tons of gold ore have been treated with technical as well as financial success, and the gold has been extracted not less easily—in fact, better and more cheaply—with bromine than with chlorine solution, is surely worth knowing. Last year the Asiatic cholera invaded Europe, and the price of chloride of lime advanced materially in consequence. I then employed bromine instead of chloride of lime and sulphuric acid, and practiced barrel bromination at the Black Hills Works in Rapid City, S. D. The cost of bromine was at first 35 cents per pound, but we received it later from the manufacturer on contract for 26 cents per pound. One to one and a half pounds was all that was needed per ton of ore that had been roasted fairly well. On well roasted ore less than one pound was quite sufficient. The outlay of 26 to 40 cents for bromine per ton of ore compared very favorably with 80 cents to $1 for chloride of lime and sulphuric acid; besides which, the handling was more convenient, and the extraction was from 50 cents to $1 better on ore that was not roasted as well as it ought to have been. We consequently changed altogether over to bromination. Thousands of tons have been brominated since, and I believe we have fully demonstrated, on a large scale, the technical and financial practicability of this branch of metallurgy. The methods of precipitation with the H_2S and SO_2, and the refining of the gold sulphides, as described above, worked as well on bromine solution as it had done before on chlorine solution, and made no changes of plant necessary.

*A paper read at the Virginia Beach meeting of the American Institute of Mining Engineers.

THE Anaconda, Montana, coal properties are soon to be put in operation. One hundred coke ovens are already finished and the coal washing plant is in operation and working well. Within a few days the ovens will be charged and the manufacture of coke commenced.

Arizona Gold Ores.

Dr. Theo. B. Comstock, in his capacity as director of the bureau of mines and geologist, has several tests of Arizona gold ores. He finds, as stated in his report to the board of regents of the university, that the Territory has three classes of such ores: (1) Those which are really "free" ores; (2) An intermediate class, partly "free" and partly "sulphuret;" and (3) The "sulphuret" ores. Many miners, who get colors in the pan or horn spoon and who afterward get good assays from their ore, are disappointed at the low percentage saved in the milling process. This is usually because they have overlooked fine-grained black sulphide which forms a considerable portion of the ore, although it may not be visible in the rock. Dr. Comstock is satisfied, from his investigations, that the working of gold ores in Arizona is yet in its initial stages, for there are deposits enough, rich enough and extensive enough to tempt the investment of capital, guided by thoughtful and economical engineering talent, when once the ores are understood.

THE use of malleable iron in car construction is spreading rapidly and railroad men are realizing that it is a material thoroughly adapted for that purpose. Nearly all of the castings employed in car work are used without any finish, and the smooth castings of uniform dimensions obtainable in malleable iron, and the greater strength, combined in most cases with a considerable saving in weight, makes this material particularly suitable for car construction. In 500 cars for which a Chicago firm has recently contracted, more malleable iron is employed than in any other cars thus far constructed. For some years past an important American line has employed malleable iron in the construction of its refrigerator cars, and the extensive use of malleable castings has been with this company a matter of several years' growth. On the cars just ordered, even the journal boxes are of malleable iron. A list of the parts which are cast in malleable iron, together with their weights, shows that there are nearly 1500 pounds of such iron in each car.

RECORDER SHIBELL, of Pima Co., Arizona, furnishes some figures on the working of mines by lead pencil done in 1894 through the exemption act of Congress, setting aside the requirements of $100 worth of work on each mine annually. During 1894 1200 mines in Pima county were exempted, the filing with the recorder being done on 300 blanks. These 300 notices cost $450 to file, and that was all the expense. Thus $450 did all what in other years would require $120,000 to do. On the 1200 mines thus recorded, work would have been done to the extent of at least $50,000. Many mine owners are well-to-do, and the poorer men, who would have done the work, are thus kept out of $50,000, in Pima county.

A NEW YORK PHYSICIAN writes to the *Electrical Review*, saying: "A watchman or janitor in the Thomson-Houston electric light station, 425 East Twenty-fourth street, New York city, a man about sixty years of age, recently told me that he had been for thirty years a sufferer from rheumatism. He had been employed in the electric light station, however, for the last three years, and for nearly all this time he had been free from rheumatism. He also stated that not a man in the station had rheumatism, and he considered the immunity due to the electricity."

THE first passenger steamer in the world to be lighted by electric lights was the Columbia, plying between here and the Columbia river. The first sailing vessel to be lighted by electricity is said to have been the Spanish bark La Vigusea, a bulk-oil and general cargo carrier. She is fitted throughout with incandescent lights, the power for the dynamo being furnished by a small oil engine, which also furnishes power to pump her oil cargo when she is loading or unloading.

WHAT is believed to be the biggest gas engine in the world is in operation at Pantin, France, where it drives a flour mill. It is capable of indicating 450 horse power, but the maximum load on it is only 280. It is operated with gas made on the premises, and the plant yields one horse power to each nine-tenths of a pound of coal consumed by the gas producer. Most steam engines require from one and one-half to three pounds of coal per horse power.

THE latest use for pulp is in the manufacture of paper pneumatic bicycle saddles. Bicycle mechanics have long since striven to invent an easier riding saddle for modern safeties. Well subdued pulp is compounded with certain ingredients and the saddle cast in parts. The two parts are the top and bottom, around the edges of which are ridges, which are lapped, sewed together and cemented.

THOUGH gold is not officially at a premium, gold refineries are now shipping gold bars to the East, and to brokers, instead of depositing in the mint, where, without any expense for expressage, they could get its coinage value.

Ore Production Without Profit.

In noting that meetings of prominent iron-ore producers have been held in Cleveland during the past few days to endeavor to arrange some plan of securing better prices next season, *Iron Ore* gives the following account of the financial results at several of the largest workings in the Lake Superior region during the past two years:

The big Minnesota Iron Company, with its vast stores of ore, its fine equipment and thorough systems, with its magnificent carriers on the lakes and its own railroad, has been unable to pay a single cent in dividends to its shareholders. For two years it has nothing to credit in the line of earnings, and those who have money invested in this giant corporation have received nothing therefor in the shape of earnings. The investment reaches well into the millions, and there must be a paying market in order to give return for these vast amounts. With all its many advantages, it has not been able to declare a dividend.

The Cleveland-Cliffs, with no royalties to pay, with abundant capital, with properties well located with reference to market, and with long experience in the business of mining, has failed to pay its shareholders a cent in the past two years.

The Lake Superior, with its fine possessions, cannot earn a dollar more than the cost of operating, and it has every advantage to carry on its affairs economically.

The big Tilden mine, of the Gogebic, is something like $500,000 in debt, and its affairs are in the hands of a receiver.

The Norrie finds no profit in the business, notwithstanding the fact that it sends out about a million of tons annually.

The Oliver, mining over half a million tons last year, lost anywhere from $20,000 to $75,000. Its ore was secured by steam shovel, and as cheaply as at any other Mesaba property. It is a royalty-payer.

The Chapin, the largest producer on the Menominee range, has been worked for several years without profit.

These concerns possess the most valuable properties in the different Lake Superior fields. The best machinery is employed in the working of the different mines. No other iron-ore producing region in the world is so progressive in this feature. Special attention has ever been given to a securing of the best, and calculated to cheapen the cost of mining. We secure our mine timber cheaply, explosives are very low, supplies of all kinds are reasonable, and still we are without profit.

Mexican Industrial Exposition.

An international exposition of industries and fine arts, authorized by the Federal Government of Mexico, by decree dated January 9, 1895, will be inaugurated in the city of Mexico on the 2d of April, 1896, and will remain open for a period of at least six months. This will be Mexico's first exposition, and will include all kinds of industrial, scientific, commercial and artistic productions.

The exposition will comprise a national and a foreign department, to which latter all nations may contribute, the Mexican Government granting the following privileges:

All goods and articles imported from abroad for the exposition will be treated by the Mexican Government as imported "in bond," and import duties will have to be paid only in case of sale. The materials and machinery for any buildings to be erected on the exposition grounds, or the entire buildings imported for erection there, are to be allowed to come in free of any duty.

The exhibitors and concessionaires—foreigners—those who sell foreign objects, or have shows in the foreign section, are exempt of all federal taxes.

The Mexican Government will use its influence with the railway and steamship companies to get the utmost facilities and the greatest possible reductions in the rates of freight on all goods and on rates of passage moneys for all persons connected with the exposition and visitors.

Those interested should address A. K. Coney, Consul-General of Mexico, 604 Clay street, San Francisco, California.

Edison's Forecasts.

Mr. Edison, in his speculations regarding the developments of the future, designates the greatest coming revolution to be that following on the yet unmade discovery how to generate electricity directly from coal. When science is able to do away with the intervention of steam boilers and engines in producing electrical energy, there will be a vast enlargement of the capabilities of electromotion, and an immense enhancement of the efficiency of coal as an industrial agency. It is worth noticing, adds an Eastern scientific journal, that the disposition to encourage a popular idea that electricity can relegate coal to uselessness is distinctly disavowed by Edison's view. Coal will remain the fuel of the future and the parent of all motion. Water may furnish some electric power; wind and sun power may do a little in addition, but coal will be the source of motion and power in the coming age. And the expansion of its utility in the manner suggested will increase its importance as an industrial factor. Beyond that, Mr. Edison thinks that the flying machine will come before long; that telegraphing between ships without wires is already practicable, and that new foods drawn from inorganic elements are among the possibilities. The first two developments will be anxiously awaited; but conservative mankind will be content to go on for a long time in the consolation that beefsteaks, fruits and other foods furnished by the chemistry of nature are good enough for this generation, if not for several of its successors.

Silver for Oriental Markets.

Several years ago, on his return from a trip around the world, the late ex-Governor Low, at that time one of the managers of the Anglo-California Bank of this city, was enthused over the possibility of diverting some of the silver intended for Oriental markets from London to San Francisco. It was known that England had enjoyed a monopoly of this trade for many years, even before silver became known as a product of any importance in the United States. Mr. Low expressed to the commercial editor of the *Bulletin* very decided opinions upon this subject, and requested of him a statement of the movements of silver from this port to those markets for a number of years. It was clearly demonstrated at the time that San Francisco had a natural right to handle a larger share of this trade than had been previously vouchsafed to her, in view of her proximity to the chief sources of supply in the Pacific States and Territories and Mexico, and her direct and frequent steam communication with the markets of consumption.

But Mr. Low found there were barriers to the realization of his hopes, first in the breaking of long established commercial relations with England, and also in the matter of charges. Though it was a more roundabout way of reaching the Oriental markets to send silver first to London and thence to India, China and Japan, than by way of San Francisco, it was found that the metal could be laid down there at less cost, or at least more satisfactorily, all things considered It is known that for many years the countries just named have been the largest consumers of silver in the world. Up to the stoppage of silver coinage in India, in June, 1893, that country was a particularly large absorber of silver, so much so that it had received the designation as the "Silver Sink" of the world. No one has ever been able to tell what has become of all the silver shipped to Oriental markets during the present century. For the past six years alone these shipments from England and San Francisco have been as follows:

1889	$57,654,712
1890	47,974,309
1891	41,379,445
1892	67,342,524
1893	67,715,485
1894	60,222,858

Here we have a total of $342,289,533 in six years, or nearly the total amount produced in this country, though much of the total was obtained from Mexico and other foreign sources. About 80 per cent of this silver was shipped from London, most of which was probably first sent from this country to England, thus leaving San Francisco only about 20 per cent of the trade. This unequal and unnatural condition of affairs was again recently brought to the attention of the parties interested, and a move was at once made to see if a remedy could not be found to bring about a more normal condition of affairs. California has little direct interest in the raw silver trade, because she has no strictly silver mines, but she has considerable capital invested in silver mines in adjoining States and Territories, and a direct interest in the smelting of silver ores and in the refining of crude and dore silver. It was found that if more of the silver intended for the Oriental markets could be shipped from San Francisco, it would be of much advantage to all concerned.

The chief obstacle lay in the matter of transportation expenses, including insurance and interest. These items of cost to the shipper by way of London were ascertained to a nicety, and then an appeal was made to the carriers by way of San Francisco. Wells, Fargo & Co.'s Express and the steamship lines out of this port were the parties consulted, and they met the demands of shippers and refiners in a friendly spirit. Without going further into the particulars, it may be stated that silver bullion can now be sent to Japan and China from Colorado and intermediate points on more favorable terms to the producers than by way of New York and London. The new arrangement has been in operation only a few months, but is being patronized by some of the largest producers at Denver and Pueblo, Colorado, and also at Omaha, although from the latter place only fine silver has been received for shipment. Colorado, on the other hand, is sending fair quantities of crude silver, which is refined here, thus giving us the benefit of that part of the work and the gold that is extracted from the same. Great credit is due to the parties who have combined to bring about this change. The silver shipments from San Francisco to the Orient since 1875 have been as follows:

	Silver Bars.	Mex. Dollars
1875	$281,273	$1,820,647
1876	2,537,286	2,848,447
1877	5,562,123	2,619,527
1878	8,048,485	2,189,070
1879	5,908,819	2,347,911
1880	2,401,259	2,211,574
1881	2,530,542	2,205,459
1882	3,017,290	2,399,930
1883	5,505,578	4,197,370
1884	5,993,678	8,049,496
1885	7,489,091	9,934,058
1886	7,700,771	9,230,725
1887	8,049,465	6,292,779
1888	7,902,700	5,641,328
1889	8,627,252	9,894,712
1890	302,300	6,812,997
1891	583,219	7,105,806
1892	3,020,450	10,569,945
1893	2,511,956	9,281,760
1894	7,210,950	5,369,891
Totals	$97,164,489	$111,923,432

In addition to the fine silver and Mexican dollars, as above set forth, there was also shipped from January 1, 1875, to December 31, 1889, the sum of $20,340,344 in trade dollars, made expressly for this trade at the United States Mint in this city. All but $18,550 of these dollars were shipped from 1875 to 1879 inclusive. The trade dollar was authorized in February, 1873, and the shipments hence in 1873 and 1874 were $5,406,969, so that altogether these shipments amounted to $25,747,313.

The movement of silver from Colorado to China and Japan by way of San Francisco began in the last half of 1894. The total cost of shipping $1000 in fine silver from Omaha or Kansas City to Hongkong via New York and London is $17.31 and from Denver $19.06, while to Yokohama the charges are $18.81 and $20.56 respectively. These figures include interest and insurance. The cost by way of San Francisco to Hongkong is $14 from Omaha and Kansas City and $12.50 from Denver and to Yokohama $13.50 and $12.50 respectively. Through bills of lading from Colorado to Japan and China, with stop-over privileges at San Francisco, are allowed on all silver that needs to be refined here.

A Protest.

The miners are entering a vigorous protest against the removal of the State Mining Bureau, and here in Nevada City the following memorial to the Legislature is being circulated and numerously signed:

"We, the undersigned, interested in mining in Nevada City, Nevada county, enter a vigorous protest against the abolition of the State Mining Bureau, or its transfer to the State University.

"The Mining Bureau is the only State institution maintained in the interests of the miners of California, and is doing useful and satisfactory work. It should be continued as it is and a liberal appropriation given, to still further help the mining interests of California, which need fostering just as much as those of an agricultural nature."—Nevada City Herald.

A similar protest is being circulated and signed in every mining county in the State.

Messrs. T. D. F. Andrews & Co., of London, England, have made some experiments upon the inductance of sheathed cables. The results show that, whether the sheath or outer concentric covering be of iron or copper, the inductance is practically the same; and if an ordinary copper concentric cable be used in place of the iron armored cable of the same cross-section, the results are the same in every case. This is interesting so far as it goes, but a little information regarding the periodicity at which the tests were made would add to the value of these observations.

The Plata Reina Mining Co., an American company, which operated the Pancha de Plata mine at Sonora, having lost possession by neglect to comply with the Mexican mining laws, it was "denounced" and operated by Ignacio A. Pesuira and associates, who have been successful, having extracted and shipped 600 to 800 tons of silver ore, worth $200 per ton. The Plata Reina Mining Co. are endeavoring to get the Mexican Secretary of the Interior to dispossess Senor Pesquira and award them the property.

The Debris Commission have issued hydraulic-mining permits to the Kentucky Flat Company of El Dorado county, and the New York Mining Company and the Dutra Wilder Company of Yuba county.

The Lady Emma Mining Company has incorporated in this city. Capital stock, $100,000. C. E. Brown, W. B. Roberts, M. Otey, W. H. Hamilton, N. L. Beel are directors.

A five-cent stamp now will carry a letter to any country in the world that maintains postoffices.

The Jackson, Sonoma Co., mine produced 128 flasks of quicksilver in January.

Gold Mining in California.

Discoursing of gold mining in this State, Geo. Partridge writes to the Denver *Mining Record* as follows:

There is every symptom of a great revival of mining in California. The little village of Jackson, in Amador county, which has been in a comatose condition for years, has now scarcely room for the newcomers, and Coulterville, in Mariposa, since the advent of the Boston and Montana Company, which is resurrecting the famous Cook property, is putting on airs, and talks of $400 a front foot for village lots. Prospectors are also talking many thousands for their claims all along the belt; similar activity toward it came too late to affect last year's output, but will no doubt largely increase the output of 1895.

It may be truly said that our mountains have been scarcely more than scratched, and it can be said also that failures to succeed, when they occurred, have been from reasons that would have broken any business in the world. The quartz is here in great abundance, but it takes good mining and good honest will to turn it into gold. It is quite as much a question of will as of quartz. We consider $8 ore, with a three to four foot ledge, a good bank to draw on, yet many ledges go higher as well as lower. There are some twenty to thirty feet wide that mill $3 to $4, and some that are of greater width that yield $2 a ton, and such veins have been worked a long time at a cost of fifty cents a ton for mining and milling. The ore is soft and broken and forty tons is put through a ten-ton roller mill. With the large ledges of $3 to $4 rock a large mill is the factor of success. The Utica mine of Hayward & Hobart at Angel's Camp began with $3 ore, but it got better, and with 240 stamps now yields about $160,000 monthly.

The Kennedy mine, in Amador, nets about $50,000 monthly, with 30 stamps. There are thousands of five and ten stamp mills in the State, but as all are in private hands and close corporations little can be learned of individual profits. No gold mines are listed on our stock exchange. The ground cost of mining and milling in "going" mines is but $3.50 per ton. Many a mine would pay all cost of development from the grass roots with a little two-stamp mill that costs here but $500 without power, and mills five to six tons daily. The prospector needs about $1500 to set up such a mill, and there's the rub.

About five years ago a miner offered a mine he had bonded and put a five-stamp mill on at an inconvenient distance, so that he could only about meet expenses from an eight-foot ledge of $8 quartz. He was in debt and offered to sell for $25,000, but he could get no buyer. So he pegged away, and in two years he had twenty stamps and a monthly income of $8000 net; then capitalists wanted to give him $200,000 for it, but he concluded it was worth that to keep.

This suggests the apparent mistake that capitalists make in trying to buy a paying proposition at a big price, based on its current output and what is in sight. The late George Hearst used to tell the boys: "I'll give you what you have in sight and take my chances on the rest for profit," but estimates generally disagreed. When a mine is equipped with a mill the owner is independent, and as a prominent expert here says, asks a price that will pay about four per cent on the investment. When he has no mill he is on his knees and the buyer can purchase and equip for a fraction of what the equipped mine would cost.

The mountains are full of partially developed prospects that can be had for a pittance in comparison, with safe evidence of a good ledge. Half-interests are plentiful for a mill and working capital, and an option for a year on the other half.

The free-milling character of all our ores makes milling cheap. Gold is saved over concentrators at a cost of about $1 per ton. Mining is safe for a good profit with a three-foot ledge of $5 ore. Tunnel mines give the minimum for mining expense, of course, but our deepest shaft mines require no costly pumps to keep down the water. It seems foolish for miners to go to Africa or Coolgardie with the best of conditions at home, and only a few days' ride from the city; but distance lends enchantment. Some of our capitalists have worked in Mexico, but with poor returns, with a few notable exceptions. A brilliant success has lately been achieved in Lower California, forty miles inland from the Pacific coast. With ten stamps $125,000 was made last year, and twenty more stamps are now being placed. The grade of ore is over $100, and there is enough in sight for years. It has been developed 400 feet. A prospector has recently located sixteen claims in another locality, showing outcrop from three to forty feet wide that mills from $20 to $30, and offers half for working capital. There is little silver in California; she therefore cares little what becomes of silver, though nine-tenths of the people favor giving silver the old chance at free coinage. The diversion of mining in Colorado to gold will make many of your people lukewarm about silver ere long, but after all the agony over gold, what is the aggregate gain? In a year there is about as much produced as goes abroad in a few days, and the goldbugs think that the single standard can be sustained on this.

AFTER a session of ten days the coroner's inquest into the causes of the terrible explosion in Butte has resulted in a verdict charging that the deaths caused by that dire event were due to the explosions of dynamite in the warehouses of the Kenyon-Connell Commercial Company and the Butte Hardware Company; that the fire started in the Kenyon-Connell warehouse; that the first large explosion occurred there; that the second large explosion took place in the Butte Hardware Company's warehouse; that the two companies have been criminally negligent and careless in carrying in their warehouses quantities of powder in excess of the amount allowed by law, and that the two companies are responsible for the deaths of the victims of the explosion.

WE ARE IN RECEIPT of the report of Messrs. Grunsky & Manson, consulting engineers, with accompanying maps, regarding the proposed system of drainage and protection works for the valley of the Sacramento. It is comprehensive and feasible. The report estimates a total cost of $9,287,000. While this appears a large amount, it must be remembered that the expenditure would furnish drainage and permanent protection to a region that has already unsatisfactorily expended $17,000,000 for similar purposes. The report is an exhaustive one and is the result of the steady detail work of over a year.

PLACER

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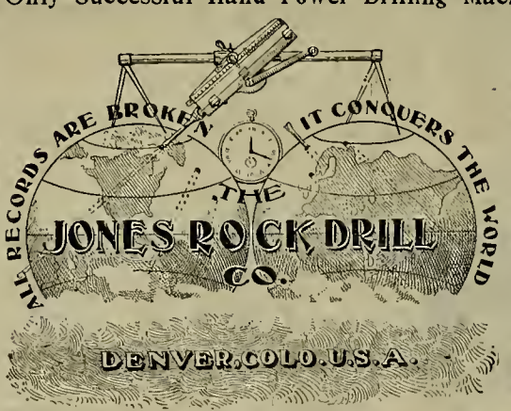

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The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XXI.

1880.—There were produced 40,552 barrels of crude oil in 1880, bringing the total yield up to 275,637 barrels.

1881.—Oil produced in the State this year amounted to 99,862 barrels; total to date, 375,499 barrels.

A. C. Dietz & Co. established the Berkeley Lubricating Oil Works for the manufacture of lubricating oil from California material, brought from Ventura county. He turned out 100 barrels per day, so published. In February there were seven new wells being drilled in the State, and the last year's output was doubled. The oil business in California was at that time of greater magnitude than was generally known. Citizens of Los Angeles, Ventura and Santa Barbara counties signed a petition asking the United States Government to instruct Clarence King, then Government Geologist, to make special surveys of the oil regions and to note the development since 1865. They represented that a belt of oil shale extended for eighty miles in length, from the San Fernando district in Los Angeles county through Sespe, Santa Paula, Ojai and Sulphur mountain in Ventura county and the Carpinteria and Santa Barbara districts, terminating in the Pacific ocean at Goleta, in Santa Barbara county; that though the indications were encouraging, yet the work had been done somewhat blindly and without scientific guidance. Much money had for this reason been lost—believed to be as much as $1,000,000—with unsatisfactory results. Practical oil men and capitalists familiar with the subject were of the opinion that the results of their work indicated that a large quantity of petroleum of good quality existed, but they feared to progress without scientific investigation. In consideration of the importance to the whole country of the vast interests involved, they felt that they had a right to ask aid from the General Government.

1882.—Oil produced in the State, 128,636 barrels; total to date, 504,135 barrels.

1883.—Oil yield of the State, 142,857 barrels; total production to date, 646,992 barrels.

1884.—Maltha and crude brea were known in San Luis Obispo county in 1874; in 1884 samples of each were brought to the State Mining Bureau, also from Steele's ranch, which were described as rising from a natural well 100 feet deep "from which it overflowed and became solid asphaltum." This specimen is marked No. 5058 in the museum catalogue.

In 1884 the annual production and consumption of asphaltum in the State was estimated at 3500 tons, and the price in San Francisco was from $9 to $11 per ton, according to quality.

Mr. Lyman Stewart, of the firm of Harrison & Stewart, stated to me that the Pennsylvania company, of which he was a member, had invested in Pico canyon and elsewhere in Los Angeles and other counties $130,000, a large portion of which was a loss. They sauk six wells in Pico canyon and one in Sauta Paula, all of which were "dry holes." Mr. Stewart came to California from Titusville, Pennsylvania. He brought out thirty men, all of whom were skilled workmen. Some of the wells sunk by them were deep. He said if he could obtain one well the company would soon make up the loss. They were then drilling in Pico canyon near the Pico well.

On the 19th of September the Ventura *Free Press* published the followiug: "At last the long-looked for oil began to flow through the pipe line from Santa Paula; the pure oil began to flow yesterday at two o'clock."

The Pacific Coast Oil Company produced twelve barrels of crude oil daily from the Santa Cruz mountaius, eighteen miles from San Jose, and from ten to twelve barrels daily from near Pescadero, San Mateo county. Crude oil was largely used for making steam in various parts of the State.

The San Fernando district produced 625 barrels and the Ventura wells 700 barrels daily for a portion of the year. The total yield for the State for the year was 262,000 barrels and the graud total to date 908,992 barrels.

1885.—During this year companies were organized and were prospecting for oil in Alameda and San Mateo counties. The State production of oil was 325,000 barrels, making the total to date 1,233,992 barrels.

1886.—There was considerable prospecting for oil during this year. Crude petroleum was largely used in Los Angeles, Santa Monica, Pasadena, Monrovia, Santa Ana and other towns. It was fouud to possess all the requirements for fuel in numerous manufacturing establishments iu southern California. At Los Angeles the monthly cousumption was said to be 3000 barrels; some large establishments required as much as 500 barrels monthly. The price per barrel was about $2.31.

At Sycamore Grove, near San Louis Obispo, A. Walker, F. Adams and Dr. G. R. Nichols commenced sinking a well for oil. At 936 feet hot sulphur water rose, holding in mechanical suspension a considerable quantity of natural gas, much like the wells in Stockton. All hope of obtaining oil being abaudoned, and the water flowing in abundance, a health resort was established, which met with encouragement. It is now known as the "Sycamore Hot Sulphur Springs." The water has a temperature of 103° F. and a distinctly mineral taste. It is situated on the railroad, about seven miles from San Luis Obispo and three from Port Harford. I visited the locality in May, 1893.

Sespe canyon is credited with the yield of 700 barrels of oil daily, Newhall with 450, Puente with 100, and other districts with 50—a total of 1300 per day. This is evidently an overestimate, for the production of the State for 1886 was but 377,145 barrels, instead of 474,500 by the first-stated estimate.

The total State production to this date was 1,611,137 barrels.

1887.—The largest producing oil well in the State, situated six miles from Santa Paula, Ventura county, flowed for a time 600 barrels daily without pumping. Several pumping wells in the same neighborhood produced from 100 to 200 barrels per day.

There was much prospecting during this year but no new districts were discovered. Crude oil was more largely used in San Francisco, and the consumption in the southern part of the State continued. Three barrels of crude oil were cousidered equivalent to one ton of the best steam coal. The New Almaden quicksilver mine and Clark's potteries in Alameda used it for making steam. The Pacific Gas Improvement Company used seventy-five barrels daily in making gas. The San Francisco and the Los Angeles gas companies altered their plants, or were about to do so, that oil might be substituted for the more expensive coal in the manufacture of illuminating gas.

Crude petroleum of California production was sold in carload lots for $1.50 to $1.75 per barrel, and there was au increased demaud for the uew fuel in the State.

A new refinery was being built in Santa Paula, Ventura county, and Newhall oil, refined at Alameda Point, began to be considered the best illuminating oil produced in the State.

The chief producing counties were Los Angeles, Ventura and Santa Clara. The annual yield had increased to 678,572 barrels, and the total State production to that date was 2,289,709 barrels.

Bituminous rock in large quautity was discovered on the Coral de Piedra ranch, six miles south of San Luis Obispo, in January, by Mr. James Cormack. During the year 3600 tons were extracted and sold. The San Luis Obispo Bituminous Rock Company was incorporated.

1888.—During this year, by uewspaper accounts, twelve counties in California produced oil, as follows: Alameda, Colusa, Humboldt, Los Angeles (420,000 barrels), Monterey, San Benito, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz and Ventura (237,000 barrels). This probably includes asphaltum as well as petroleum.

By this estimate Los Angeles and Ventura countics produced jointly 657,000 barrels. United States statistics credit the State with 690,333 barrels, leaving 33,333 or its equivalent to be divided between the other counties mentioned. The total product of California, including this year, was 2,980,042 barrels. The principal oil-producing wells were at Puente and Pico, Los Angeles county, and at Sespe, in Ventura county.

In December, in Adams canyon, Sespe, a well being drilled spouted oil seventy feet high, from a reservoir tapped by the drill 700 or 800 feet below the surface; the well began to yield at the rate of 800 barrels per day. Two wells in San Mateo county each yielded a small quantity of oil.

A San Francisco newspaper published the following:

AN OIL FLOW.—A Los Angeles paper says: Reports from a most reliable source reach this city to the effect that the oil horers in Adams canyon, in the Sespe country, Ventura county, have struck it rich. The flow, as Dame Rumor represents, equals 1100 barrels a day for the last well sunk. It is said, moreover, that the well is capped, as well as they can cap it, to keep the oil from flowing in even larger measure. As it is, there is no means at hand to take care of such a Pactolean stream and this richness is running wild all over the country. They are leading it into all sorts of natural receptacles to prevent an oleaginous flood. If this is true, as it most likely is, the good news is of the highest importance to this section.

The Union well, at Buena Vista, Kern county, one and a half miles from the Columbia, was drilled in 1888 or 1889. At 720 feet, while driving a pipe, a series of pulsations began, which caused an eruption of rocks and an escape of gas, "which raged aud roared for half a day." This statement was made to me by Mr. Hambleton, who was there at the time. Some of the stoncs ejected might have weighed five pounds. Considered as ruined, the well was abandoued. Mr. W. E. Youle, who was superiutendent in 1889, thinks this phenomenon was caused by the rising of water iu the pipe, and not by gas. He has had a similar experience. He thinks that if the eruption had been caused by gas, it should have occurred while the tools were still penetrating the earth at the bottom of the well. On the other hand, a person considering the matter would be loath to admit that a rise of water could produce a sufficieut rush of gas to eject stones, or would have continued for half a day, "with a roaring sound, as described. Mr. Hambleton was quitc convinced that there was a genuine escape of gas.

Deposits of gas were discovered in Canyon Diablo, Sau Miguellito, the property of the Ventura Asphalt Company.

A large deposit of bituminous rock—so called — was discovered in Santa Cruz county during the winter.

1889.—The yield for this year was 30,220 barrels, making a total of 3,283,262 barrels produced so far in the State.

(To be Continued.)

To Operate California Mines.

The Nebraska Gold Mining Company filed articles of incorporation. Its capital stock is fixed at $500,000, divided into 25,000 shares of the par value of $20 each. The officers aud incorporators are Henry W. Browu, president; John Heimrich, vice-president; John Dern, treasurer; E. H. Aires, secretary, and William S. Brown, the same persons constituting the board of directors, and all of Salt Lake City excepting John Heimrich and William S. Brown, who are residents of Nebraska. The property of the company is described as the Ohio and Mouutain Lion Mining claims, situated in Cottonwood mining district, Siskiyou county, California. The general offices of the company are located at Salt Lake City.—Salt Lake Tribune.

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Mechanical Progress.

The Simplon Tunnel.

At a recent meeting of the Pacific Coast Technical Society, at their rooms in the Academy of Sciences, some interesting notes were read on the great tunnel under the Simplon between Switzerland and Italy. This will, when completed, be the longest tunnel in the world—12¼ miles, as against 9½ miles for the St. Gothard, nearly 8 miles for the Mount Cenis and 4¼ miles for the Hoosac. As proposed by the report of engineers in charge of the preliminary work, the two tracks will not be carried in a single large tunnel, but in two smaller parallel ones, 58 feet apart between centers, and connected every 660 feet by crosscuts. The average area of the section of each of the tunnels is to be about 250 square feet, the width 16 feet 5 inches and the height 18 feet. The plans of the contractors are explained at length in a recent issue of the organ of the Swiss Engineers' Society, and are quite different from the methods generally adopted heretofore. As the contract calls for the completion of one of the tunnels and the construction of a working gallery along the line of the second as the first portion of the undertaking, the contractors, Brandt, Brandau & Co., of Hamburg, have decided to drive two galleries from each end as the basis of the two tunnels and to connect these every 660 feet by the crosscuts, which the contract calls for. One gallery will be enlarged immediately to the full cross section to form tunnel I, while tunnel II will be completed only when the first no longer suffices for the traffic. The clear section of gallery II will be used for ventilation, and as it has an area of 86 square feet, it is believed to be ample for the purpose. Its entrance will be closed by doors and air will be blown into it by powerful fans. The crosscuts are to be closed, except the two end ones, so that the air must pass in through gallery II and out through gallery I, thus maintaining a current which is expected to ventilate the workings sufficiently. The material excavated in tunnel I is to be taken out through the same tunnel in traius drawn by steam engines, which will go back to the workings through gallery II and the crosscuts. Both galleries will be driven by Brandt hydraulic drills, three or four at each heading, and it is expected that the progress made with them will be at the rate of 19 feet a day. Recent improvements in the drills have materially shortened the time required to make the holes for one blast, and the efficiency of the latter is increased by reason of improvements in explosives. The contractors also expect to make a considerable saving of time by throwing the blasted rock backward with hydraulic power at the moment of the explosion. Thus the rock, instead of lying within a few feet of the face, is scattered back for some distance, and the drills can be set up again in a shorter time. The tracks laid for carrying rock and supplies in and out of the galleries are connected through each crosscut, and have a gauge of 2 feet 7½ inches. The air for ventilation is to be forced into the tunnels by two 18-foot fans at each portal, and a number of devices are to be employed to make the progress of the air through the workings conform to the plan laid out. For doing this work the contractors are to receive the sum of $9,040,000 when the tunnel I and the gallery II are complete, and if this part of the undertaking is not completed in 5½ years, they are to be fined $1000 a day for the remainder of the working period. There is a previous payment of $1,251,000 when the power plant and other apparatus for working are set up, but the large payments are not due until the first tunnel is ready for regular traffic.

Now that photographs are taken of the underground workings of mines, the proposition of Professor Glusmatt to use aluminum powder, instead of magnesium wire, for producing the necessary light will be found of interest, especially as aluminum is far cheaper than magnesium. The mixture recommended is the following: Aluminum powder, 21.7 per cent; sulphate of antimony, 13.8 per cent, and chlorate of potash, 64.5 per cent. The combustion of this powder, in effecting which great precaution is necessary, is excessively rapid—only one-seventeenth of a second; but the duration may be increased to one-fifth of a second by mixing thirty parts of aluminum powder with seventy of chlorate of potash.

Machinery in Business.

"The desk of a business man nowadays is quite a mass of machinery," says the manager of a firm of engineers to a representative of *Machinery*. "Just look at this one of mine, for example. To begin with, here is a phonograph, into which I dictate all my letters. Afterwards a young woman, who acts as my amanuensis, takes the cylinders and copies them off. For communication otherwise than by writing, I have at my hand a small stand which supports a telephone. It is ornamental and movable. I put it out of the way or set it in front of me, according to my convenience. With this little instrument I can talk from my desk with all the world. It is a long-distance telephone, and with it I can call up Paris as well as Liverpool. Besides, I have at my other elbow a similar contrivance for communicating with the various rooms under my superintendence in this building. At a moment's notice I can make connection with any one of them by sticking the plug into the proper place in this circuit board. My desk is a center to which ever so many wires run for a score of different purposes. Some of them furnish me with electric lights, others give power to my electric fan. Overhead you notice a clock, which at noon every day is corrected by electricity from the Royal Observatory. My office is a nest of machines and wires, the latter reaching out to the uttermost ends of the earth. For, by means of this telegraph sounder at my left hand, I can transmit intelligence to America, to India, to New Zealand or to Hongkong. It is not without reason that this is called the age of mechanical civilization."

A 320-H. P. Gas Engine.

The flour mills of M. Leblanc, at Pantin, France, have been provided with a 320-horse power fuel-gas engine of the Simplex type. The machinery and gas generators are arranged for continuous working, day and night. The gas is washed and scrubbed and run into a gas holder. There is no india rubber in the apparatus. With coal gas the machine gives 450-horse power. There is one cylinder, 34.8 inches in diameter; the piston stroke is 40 inches, and the speed 100 revolutions per minute. Special arrangements have had to be devised in order to keep the different parts of the machine at appropriate temperatures. The coal used is 0.812 lb. per indicated, or 1.03 lb. per brake horse power. The water used is 8¾ gallons per brake horse power per hour. After a three-months' run the tests were repeated and then gave even more favorable results. Everything is done by machinery in these mills, and the gas engine also runs the pumps and 300 glow lamps. The consumption of coal is remarkably small as compared with that of steam engines of the same power. Anthracite is unnecessary, for the new generators devised by the Buire-Lencauchez need only poor coal, at half the price of anthracite. Better coal yields too much tar, which is difficult to deal with; and the problem of the future is to use small coal and coal dust.

Gas Motor on Shipboard.

A novel method of using coal gas in navigation has been successfully tried at Havre, France, for a syndicate of capitalists. An iron boat of 350 tons was built, a vertical gas motor of forty H. P. furnishing the power. Coal gas compressed to a pressure of 1400 pounds per square inch is stored in steel tubes placed between decks, and a regulator situated between the gas reservoir and the motor reduces the pressure of the gas entering the motor to the flow ordinarily required. Trials have been made with this boat in presence of the mayor of Havre and the harbor officials, and the result was absolutely conclusive. This new boat, christened L'Idee (The Idea), has been over the course from Harfleur to Rouen and behaved perfectly. It was a source of wonder to all to see her wending her way among the large vessels in port at full speed without noise and without smoke. The captain has full control over his vessel from the bridge. He can change her course, slacken or increase her speed, and stop or even go backward almost instantaneously, thanks to the reversible screw. Before long a flotilla of sixty similar boats will perform a regular service between Paris and Havre and Paris and Creil. Gas works are building along these routes, and will supply the gas according to the needs of the service. The cost of power will be more economical than any other, but the chief saving will be effected in the comparatively small room taken up by the motor, allowing considerable more freight to be taken in. A remarkable fact, worthy of notice, is that pure coal gas, compressed to a pressure of as high as 2000 pounds per square inch, does not show an appreciable condensation.

Pipe Bending.

Small iron pipes, up to one inch in diameter, may be bent cold and even coiled by winding them around a mandrel in a lathe, provided the diameter of the coil is at least nine or ten times the diameter of the pipe to be bent. Short bends in iron, brass and lead pipes are apt to flatten at the bend. This is frequently prevented by filling the pipe with lead, which must be melted out after the bending has been completed. A set of "bending coils" can be easily made by any machinist for use when occasion demands. A separate coil is needed for each size of pipe to be operated upon. Steel wire is wound into a coil, which will slide easily inside of the pipe to be bent. One end of the coil should be tapered to allow it to enter the pipe easily. The other end ought to be fitted with an eye turned in the end of the wire. Into this eye a cord or chain must be fastened, so the coil may be pulled out of the pipe after bending. The pulling out of the coil does not require as much power, after the bending, as would be supposed, because the pulling of the coil lengthwise causes a decrease in the diameter of the coil, which permits it to be drawn easily out of the bent pipe. Wire one-eighth of an inch in diameter should be used for a bending coil for a pipe one inch in diameter; for one and one-half inch pipes, one-quarter inch should be used.

THE most powerful dynamo ever constructed in the world has been shipped to the Niagara Falls Power Company and the Cataract Construction Company. This mammoth electrical generator is one of three to be attached to the monster 5000-horse power turbines built and placed in the wheel pits of the power company.

JUDGE GROSSCUP, in the U. S. Circuit Court at Chicago, has declared the Thomson-Houston Regulator patent invalid.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MINING ITEMS.—*Record:* Sonth Eureka—The contract for sinking the shaft 150 feet deeper, more or less, was let last Monday. There were about twenty bids received. The following-named persons constitute the crew to whom the contract was awarded, they being the lowest bidders: John A. Bennetts, Nick Balcovich, S. H. Hoskins, John Chenoweth, James Dahh, Amos Treloar, Thomas Trevana, John Rodda, John Marchetti. The contract price is $11 per foot, contractors to furnish powder, candles, caps and fuse. While this is considered a low figure, it is claimed that they can make small wages—from $2.25 to $2.50 per day. The shaft is down 900 feet, and this sinking will carry it to about 1050 feet. The total cost of sinking to the company will exceed $20 per foot. It is pleasing to be able to state that the prospects are flattering that the South Eureka will prove one of the best paying mines in the county in a year or two. One level at 750 feet has been opened, showing a fine ore body. It is the intention to open up another level at a great depth, and this developmeut is expected to be equal to keep a mill running steadily. It is the intention to erect a mill this spring, of what capacity we have not heard.

KENNEDY.—This mine continues to yield its usual generous quantity of the precious metal monthly. Notwithstanding the heavy flow of water, consequent upon the unusually heavy rainfall, no difficulty has been experienced in handling it, thanks to the existence of two working shafts. The lowest drift is at the 1750 foot level, hut no stoping has been done there as yet, and it is not probable that any will he done for a year or more yet. A station has been cnt at the 1850 level. The south shaft is down 1950 feet and the north shaft is now being snnk to the same depth.

MISCELLANEOUS.—The steam whistle of the Anita mine was heard for the first time this week. This makes five mine whistles within hearing of Jackson, namely, Kennedy, Zeile, Alma, Argonant, and Anita. The draining of the Anita shaft is in progress, and sinking will he resumed in a few days.

The water in the Zeile shaft has slacked up since the heavy rains ceased. It is still very strong, however, requiring the constant activity of the pumps to control it. The repairing of the shaft bas reached the 700 level, about one-third of the entire distance. It will he two months before mining can he resumed.

J. Benardis is operating the Maximillian quartz claim, near Sutter Creek. He keeps a three-stamp mill at work, and is feeling his way cautiously to a higger venture. The property is on the east vein of the motber lode—low grade rock, hut vast quautities of it.

The case of Amador Gold Mine vs. Amador Gold Mine Limited, is on appeal before the Supreme Court. The transcript on appeal was filed in the higher court last week.

Pipe laying to convey water from the Oneida Hill to the Argonaut mine was resumed last week.

Inyo.

At Mountain Spring, on the east side of Salt Wells valley, on the old Darwiu stage road, about twenty miles from Indian Wells, there are about fifty men in the new camp and more are going there. There has also been a revival of the old mines about fifteen miles west of the stage station at Red Rock. These mines were worked many years ago and abandoned. The old tunnels bave been cleared out and good strikes of ore are reported. F. Fitzgerald and W. Smith have struck a good mine about two miles west of Modock, wbich will yield a large quantity of good ore carrying both gold and silver. The Sorba mine, at Darwin, owned by D. C. Lane, is being exclusively developed and put in condition to be worked on a large scale. It is said that J. J. Morton has an excellent property at Snows Canyon, a rich strike having heen recently made. Tbere is a good deal of activity in mining interests all over soutbern Inyo and 1895 will undoubtedly he a prosperous year.

Placer.

THE MARGUERITE MINE.—*Republican:* Some very fine rock from the Marguerite mine is exhibited by its president, Geo. Schmitt. The owners of tbis mine are much encouraged from the present development. A new pump will immediately be put in to clear tbe mine of water, and soon a chlorination works will be erected to reduce the ore. Tbe right kind of men bave bold of this mine, and if there is anything in it they will find it out.

NOT CONSISTENT.—*Herald:* The anti-debris men of tbe valley are doing everything in their power to prevent the Legislature from making an appropriation to construct dams for the impounding of debris from the hydraulic mines. We bave heard of hogs hut they take the cake. They claim it a private industry and that the proposition has no right to receive financial support from tbe Government. They lose sight if the fact that the dams are for their own protection and not tbe miner's; that it is to keep the debris from ruining (?) their land and filling the river beds. Why not, "live and let live?" Why do the valley people keep agitating this question when they know—if they would admit the truth—that by construction of dams their lands and rivers are safe? Come, neighbors of the valley, give the miner a chance.

Sierra.

AT ALLEGHANY.—*Tidings:* Matters are at a comparative standstill in camp at preseut on account of the storm. Snow is still about ten feet deep at Kanaka creek, where are located several mines and mills. The Gold King mine, the Rising Sun and the El Dorado, have each erected a ten-stamp mill during the past year, the two former running by steam power, the latter by water. The Mariposa, on the same creek, has no mill, but the owners have been working quite a force of men in developing the mine, with bright prospects ahead. The El Dorado has sufficient ore on its dump to keep the mill running for four or five months. Tbe Gold King and Rising Sun are also taking enough good rock from their properties to keep their mills at work. The last storm continued without cessation for eight or nine days, and by recent slides the water ditches became blocked. It is thought that the prospects about Alleghany for the coming season are excellent. The mills now in operation will prove that profitable workings are possible, and this will stimulate development work in other mines, and prospecting on all sides will be resumed.

The Lake Valley mine did a great deal of preparatory work last fall and summer. A sawmill and a roaster were erected. The framework of a 20-stamp mill is up and an electric power plant on the ground, hut not in position.

San Bernardino.

C. O. Barker of Banning and J. C. Fish are the owners of the Somerfield gold mine near Salton on the Colorado desert. This property has been developed by a shaft 300 feet deep, and at that depth a drift is beiug run, all in ore.

Mr. Stewart, who formerly owned the store at Keystone, has bought the five-stamp Shadow Mountain mill, and as soou as a few alterations are made will start up the mill on ores of that district. The mill is eight miles distant from the principal mines.

Both the Bronze and Boomerang mines at Vanderbilt reduced their force of miners during Christmas and New Year weeks, and have put very few of them back to work again. There are several idle men in camp and more coming in daily, most of them needing work very badly.

The Holcomb Valley Gold Company has bad supplies cut short by the storms, the road to Holcomb being completely blocked by large piles of snow. The company expected to get in all their uew machinery tbis winter, to make an early start in the spring, hut it is doubtful now if they will be able to accomplish it. They are sinking several shafts, a large one for water and another (the Nelson) for bedrock. When they reach the deep bedrock you may expect to see the yellow metal at a discount.

Metzger Bros. have been working their two-stamp mill snccessfully, now having plenty of water.

"Lucky" Baldwin and the Budd Dohlo Company have split on terms. Doble has dissolved his company and will haul away what preliminary machinery they had on the grouud. Baldwin is said to he forming a company of his own, to start the old Gold Mountain mines again in the spring.

The Black Hawk gold district is coming to the front again. Two important strikes have been made within the past few weeks.

Joseph Zanini and hrother have a chloriding contract on one of the Black Hawk Company's miues (the Santa Fe). They have struck a large, rich body of gold ore and are now arrastraing some of the richer rock. The strike is of considerable importauce, as it is in a good, solid formation and the highest point on the company's ground. The ore runs from $20 to $100 per ton.

O. C. Leach has made another rich strike on his Opera mine, the eastern extension of the Black Hawk group. He has uncovered a vein of considerable widtb, two feet of which is high-grade gold ore, perfectly free milling and soft. The footwall has a nice clay wall and gives every indication of a permanent body. The ore has not yet been assayed, but from panning, tests would indicate $50 per tou.

The Morongo Gold Company, Morongo mining district, have settled their difficulties and paid up. Judge Campbell has now the management. The company have let a contract to rnn a tunnel some 400 feet to connect witb two shafts now down 170 feet each. This will give good air, and at the same time develop the mine. They expect to start up their ten-stamp mill in the spring.

The Altuma Gold Company of the same dishave also let a contract to strike their ore ledge at the depth of 300 feet by running a tunnel some 200 feet. They then intend to upraise on tbe vein to the 100-foot level. They think this will open up enough ore bodies to justify good reduction works.

The Rose mine people were about to start up their mill on their new strike at 425 feet in depth, when the snow intervened. F. A. Reed has beeu appointed mill superintendent. The snow did not fall so heavily in this part of the county, and they expect to commence operations in a few days.

NEVADA.

The following is condensed from official weekly reports: Consolidated California & Virginia—1650 level—Have continued to stope out ore from the new ore body above and below the sill floor of this level from the sixth floor up to the twelfth floor. On the twelfth floor a south drift started at the south end of the stopes has been advanced 16 feet in a quartz formation which assays $15 per ton. On the ninth floor, which is the first floor above the sill floor of this level, the south drift has been advanced 15 feet; total length, 65 feet; face in porphyry and quartz of low grade. At a point in this south drift 10 feet back from its face have excavated out on tbe east side in ore averaging $40 per ton. 1750 level—Have stoped ore from both sides of the winze sunk from the 1700 level north and south, from the second floor up to the seventh floor. The ore in this range has depreciated in value. On tbe fourth floor a north drift started at tho north end of the stopes has been advanced 15 feet to a point 30 feet north from the winze, running in quartz of low grade. Have extracted during the week 350 tons of ore, the average value of which per mine car samples was $43.89 per ton. Have resumed sbipping ore to the Morgan mill, which resumed running February 6th.

In tbe Opbir mine some quartz carrying a low assay is still heing cut while prospecting above tbe 1465-foot level. In the Central tunnel workings of the mine work in tbe face of the northeast drift No. 3, from the southeast drift, on the 250-foot level, has cut through clay and tapped a flow of about five miuer's inches of water, which bas temporarily stopped work at this point. At a point in this drift, 46 feet in from its mouth, a north drift bas been advanced 17 feet, and its face is in an old stope showing fillings assaying $6 per ton. The work 117 feet above the tunnel level in the northwestern part of the Ophir ground has been confined to the repairing of drifts and other openings. On and above the 1465 level of tbe Mexican mine there have been no changes during the week. As joint work with the Ophir Company, are making repairs in the Ophir shaft at the 1100-foot level and upward.

In the Hale & Norcross mine, on the 975-foot level, the streak of good ore in the face of the south drift from No. 1 west crosscut continues the same as previously reported. Have opened a small station 30 feet below the 975-foot level, in the upraise from tbe 1100-foot level, and have started a west crosscut for the purpose of intersecting this ore streak at the additional depth. This crosscut was out 10 feet at the close of last week, and its face was in porphyry and stringers of quartz. During tbe week have extracted from the 975 level of the Norcross seven cars of ore, which averaged, per car sample, $54.28 per ton. In the Best & Belcher mine, on the 250-foot level, the north drift from the bottom of tbe joint Gould & Curry winze is out 56 feet, passiug through porphyry aud quartz, and the south drift, which the Gould & Curry Company is runuing from the same point, is out 38 feet in the same material.

In tbe Sierra Nevada mine the northwest lateral drift from the Layton tunnel has reached the footwall, and at a point 340 feet from tbe mouth of the tnuuel a southwest drift has been started, with the face in low-grade quartz.

On the 900-foot level of the Union sbaft tbe joint west crosscut from the south lateral drift, 1520 feet west of the shaft, is in 469 feet, with the face in clay, quartz, porphyry and a little water.

In the Chollar during the week extracted 221 tons of ore: average value per battery sample, $20.64. The south drift on the third floor above the 550 level is out 61 feet. It has cut in its course a length of 15 feet of fair-grade ore about two feet wide. Shipped to Carson Mint bullion of the par value of $6654.76, giving coin returns of $3924.16.

In the Bullion mine the west drift, 820 station, Ward shaft, has been extended 15 feet during the week; total length, 1359 feet; face in hard porphyry.

In the Alpba Con. mine, have advanced the north lateral drift on the 450 level 15 feet; total length, 115 feet; face in porphyry and quartz.

In the Justice mine the header in branch drift from the main tunnel was advanced 25 feet. Have broken in the mine and have ready for sbipment about 125 tons of ore. The Washoe mill resumed crushing ore on January 29th.

In the Occidental, from the west ledge above the 400 level they have extracted about six tons of ore of the average assay value of $27 per ton, as per car sample. The west crosscut on the 500 level, at a point 165 feet west of main ledge, has developed a new ledge showing about two feet of ore, which gives average assays of about $30 per ton. Have commenced to drift on the new find both north and south.

In the Alta they have hoisted and delivered to tbe mill 55 cars of ore from the 825 level, the average value of which, according to car samples, is $36.28 per ton. The ore body is extending south and looking well. Started the mill on the 28th ult. Battery samples average $28.86.

ON THE COMSTOCK.—Dan DeQuille writes: There is little change in the mining outlook. Con. Cal. & Virginia is still in the lead and is yielding about the usnal quantity and quality of ore.

The Savage mine is sbowing improvement above the 1050 level, where ore assaying $28.78 is being obtained.

The Crown Point is yielding nearly 600 tons of gold quartz per week. This ore pays very regularly a little over $9 a ton.

The Alta mill has started up on ore, the average assays of which are over $32 a ton. All the ore bins are full to overflowing.

The Justice mine is now yielding over 100 tons a week of ore that pays $10 a ton.

The Hale & Norcross, Chollar, Potosi, Occidental and other mines tbat are producing ore are yielding about as nsual. Exploration work in other mines gives employment to a considerable number of men. Still there are on the lode a great number of idle mines. There is little chance of these finding work here, though many among tbem are old and experienced miners. Occasionally some of these men are sent for to fill good positions in Mexico and other mining countries. Comstockers in other lands who are in a position to employ men do not forget old friends on the mother lode.

The DeLamar, Monkey Wrench or Ferguson district has become celebrated for its rich gold mines during the past two years. It is a young gold field, not being over two or three years old, but it is one of the most promising regions in the State. The town of DeLamar is located among the mines and is a flourishing camp. It is probably 100 miles from Pioche, and is only reached after a long stage journey. There are something like 800 men in the district of DeLamar at present. Tbe April Fool and Jim Crow are two of the leading mines in the district.

ALASKA.

The Lane-Hayward-Campbell Company are talking strongly of putting up a 100-stamp mill on their Silver Bow Basin property. The bandsome little fortune wbich bas partly been taken and partly now lies revealed in Fuller First, demonstrates the great value of this group of claims, and the proprietors do not intend that tbe $500,000 recently paid for them shall very long remain there uncovered.

N. S. Trowbridge, superintendent of the Bald Eagle Mining Company at Sum Dum, in his report to the company, has recommended the construction of a ten-stamp mill on the property, and preparations are now being made for its erection as early in the spring as the weather will permit. The returns on the ore shipped by this company to the smelter at San Francisco last summer were very satisfactory, and it is from this and the superintendent's report that the company has decided to put up a mill.

ARIZONA.

The Antelope mine, situated in Pinal county, and belonging to Tucson parties, is now about in order for making money for its owners. Tbe assays have always been rich enough and the deposits of extent to gratify the possessors. The gold is so fine, however, that it has been saved with difficulty, and a good deal was lost in the slimes. It is said that by the present process of cyanide workings, with steel Cornish rolls, tbat eighty per cent of the gold can be saved. Two cyanide tanks are now in process of construction in Prescott. Iron rolls were tried at the mill, but they did not prove a success. They will therefore he replaced with steel rolls as soon as the latter arrive.

BRITISH COLUMBIA.

A GOLD BONANZA.—Butte *Inter-Mountain:* There is a mine located in the West Kootenai district, British Columbia, which has a wonderful history—the War Eagle. It is owned by P. Clark of Spokane and some Montana men. It was bonded by Mr. Clark in May last year for $23,750, developed by him by a series of tunnels and paid for before the bond expired. Since that time it has developed a wonderful richness, and promises to be a producer for years. It is already a steady shipper, and is now producing fifty tons a day, which are shipped over the Spokane & Northern and Great Northern to Great Falls, where tbe smelter runs show it to average $43 in gold, $5 in copper and $2 in silver. There are seven feet of that sort of ore in the mine. So far the total cost of mining, hauling and reduction is $20 per ton, which leaves a net profit of $30, so that ou the present output of fifty tons per day there is a clear dividend of $1,500 a day for tho stockholders. There is no stock deal on, the gentlemen who own the shares are on Easy street. The history of the transaction, viewed in the light of results, is wonderful. Mr. Clark knew the ground was rich, but he had to wait for over a year till the former holders of the hond on the property threw it up as a losing venture. The pay ore was a little farther up the hill, and at the proper time Clark went straight to the spot and began taking out gold. He struck the Poorman ledge in Canyon creek the same way.

TRAIL CREEK DISTRICT.—The Le Roi is producing and shipping an average of thirty tons of ore a day. The main shaft is down 355 feet and the company is pushing the work on the 300 and 350 foot levels, with a force of fifty men.

The ore from the Le Roi at present comes down over the Spokane Falls & Northern railroad and goes to the United Smelting and Refining Company's works at Helena, netting a satisfactory profit.

COLORADO.

YOSEMITE PLACER MINES.—At the Yosemito, on tbe line of Gilpin and Boulder counties, 27 miles from Denver, last season they ran two streams from a four-inch and a five-inch nozzle, under 125-foot head of water. Tho Denver *Republican* says:

"While California is looking to it that Colorado does not pass it in the quantity of gold produced this year, Colorado miners are beginning to employ the methods of the California placer miner in working the gold-bearing bars. While Colorado teaches the world how to mine and smelt silver and gold when found together in lode ores, California has best learned the value of placer ground and how best to work it. Her miners know that the few cents' worth of gold in a yard of dirt cannot be shoveled into a sluice aud washed with any degree of profit, and appreciate the importance of first making large expenditures for hydraulics, and they have built great plants of this nature in great number. Colorado, on the other hand, has attended to advancing tbe silver industry, and few hydraulic plants worthy of the name have been put in. That tbe change is coming is evident in the work now being done in Clear Creek canyon, in the Tarryall district, Alma, Fairplay, Montgomery, Breckenridge, and especially on South Boulder creek, where of late years much attention is being paid to the old bars tbat in the early sixties were washed by pan, rocker and sluice miners.

"The Yosemite Hydraulic and Mining Company has for three seasons heen operating in South Boulder, on the glacially deposited bars brought down in the ages of which there are no record from the lodes of Perigo mountain and its neighbors in the Gilpin county belt. T. B. Ludlum, a mining engineer of wide experience in the Dutch Flat and Gold Run districts of California, has directed the putting in of a plant that has cost many thousand dollars, though no more than is often spent in equippiug and developing a lode mine, and the resnlt is one of the best adapted plants to placer washing that has ever been constructed in the State.

"To draw the waters of South Boulder creek away from the natural channel, the Yosemite Company has a channel flume 1200

feet long, 9 feet wide on the bottom and 5 feet high; a channel 1100 feet long is being cut through a hill to connect with this. To furnish hydraulic force for washing the bars, a ditch a mile and a half long has been built to bring the water into a penstock with double compartments 12x12 feet and 14 feet high, giving a head of 125 feet and flowing 5000 miner's inches of water. The washing flume is 1120 feet long, on a 2½-inch grade, and is made up of 12-foot sluice boxes, 48 inches wide and 30 inches high, and 8-inch deck boards run the full length. These are lined throughout with block riffles 8 inches high and from 10 to 25 inches in length, after the pattern in use in California. At the lower end of the flume a novel construction to save the flour gold which has escaped the block riffles is made—in effect an undercurrent which carries the dirt under and drops it into a lower box 12x36 inches in size and 14 inches high. In this 180 riffles 1¼x3 inches wide are set on edge and covered by strap iron three-fourths of an inch apart, and the sand passing over that, the smallest globules of the amalgam are precipitated in quiet water and lodged, while the washings that may have carried them that far slip away.

SAN JUAN PLACERS.—*Denver News:* Major J. W. Hanna is from Montezuma county, where he has been testing various machines, each of which was warranted to be the best machine ever invented for separating gold from placer dirt. After spending a great deal of time in the work, Major Hanna has decided to make a thorough test of the electrical process, and has brought with him to Denver a quantity of gravel from the bed of the San Juan river. If the tests are successful a carload of gravel will be brought to the city and a final result reached in regard to the process.

"I never get excited over mining ventures," remarked the Major yesterday, "but after years of practical experience along the San Juan river, I am convinced that the region will become the greatest gold-producing district in the United States. I have 500 acres of placer that assays $3 to the cubic yard, and in many spots much higher. The highest amount I have been able to extract by processes attempted on the spot is sixty cents a yard. I have fully tested eight different machines, but not one of them meets the demand. If the electrical process will do the work, there is no limit to the wealth that can be taken from the placers of the San Juan river."

In the opinion of Major Hanna, the gold is contained in small particles of quartz, and while it is chemically free it is not mechanically free. The successful process requires that the quartz shall be pulverized, and it is upon this plan that the experiments will be made this week in Denver.

The visitor states that 100 to 150 men are washing the sands of the San Juan river this winter and are realizing $3 to $5 a day for their work. Ordinary hand rockers are used. The sand is fifteen to twenty feet deep, and the river for 100 miles below Durango presents an inviting field for men who are willing to labor. Major Hanna says that his faith in the San Juan placers increases steadily as he learns more of the gold values in the sand.

Grant Bros., of Salt Lake, have staked nearly 4000 acres of land on Sand and Bear creeks, near Garrison, for placer. They are there now testing a machine with which they expect to work it. If the test is satisfactory they will put in a $175,000 plant.

IDAHO.

A GOLD STRIKE.—Emmett *Index:* A three-foot ledge of free gold quartz was recently discovered about three miles from Marsh postoffice that promises to be the most valuable strike made in this part of the country in years. The discovery was made by Messrs. Austin and Hall, and assays of samples of the rock show as high as $231 to the ton in gold. The ledge was found on the hill directly above the rich placer mines of A. G. Church, and it is believed the strike solves the question as to where the gold came from that these rich mines have yielded for the last score or more of years. The ledge consists of hard iron rock in which the yellow metal is visible to the naked eye. There will doubtless be considerable activity in mining in and around Marsh the coming season.

MEXICO.

The mining scheme in Sonora in which are interested Messrs. Williams, Howell and Clawson of Bisbee and W. C. Green of Fairbank, is reported to be one of the most promising projects anywhere in the country. Their workings are on the San Miguel river about sixty miles east of Magdalena, and can also be reached from Imuris. The placers are very rich and will be worked on an extensive scale by hydraulicking.

MONTANA.

A GREAT PLACER ENTERPRISE.—*Mining Reporter:* Henry Albertson & Co. are the lucky owners of a valuable placer property at the head of Bilk gulch, on the line between Deer Lodge and Granite counties. They are erecting a pumping plant, the like of which has not been heretofore attempted by any other company in Montana. The pipe throws 950 inches of water per minute, through a nine-inch pump 800 feet in height, covering a vertical distance of 3600 feet to an immense box reservoir. This water is to be used for hydraulics on ground that averages from ten to fifteen cents to the pan, and can be worked six months out of a year. There are no heavy boulders in the bar, and the property is considered very rich when once controlled by a sufficient head of water.

NEW MEXICO.

Record: Since last summer a Kansas City syndicate has had a force of men making tests on 500 acres of placer ground on the Galesteo creek in south Santa Fe county. Three thousand dollars were invested in a prospecting plant consisting of an engine and a boiler, steam hoisting apparatus, pump, derricks and an air caisson twenty-nine feet long, in two sections, similar to that used in laying the foundation of bridges. Two tests have shown from 5 cents to $2.50 in gold per cubic yard. That three feet above bedrock ran $3.78 in gold, and F. E. Nettleton, mining engineer in charge, states that a plant to operate on a large scale will be put in at once.

This plant will be capable of handling 10000 cubic yards of earth and gravel per day, and will have sufficient power to lift up six inches of the bedrock. The estimated cost of handling the material is 15 cents per cubic yard.

Cerillos *Rustler:* The sale of the Good Hope, at Allerton, has been made to a Denver company that will develop it. The consideration is reported at $23,000.

A Golden correspondent writes: We have gold, silver and copper ores, the copper ores also carrying considerable gold, which makes such very desirable. While we have high and low grade free-milling ores, we have also a great deal of refractory gold ore, which can not be treated on a stamp mill.

OREGON.

Ashland *Tidings:* The miners were all down from the Ashland mine Saturday, and $1500 which had just been cleaned up from the plates at the mill in town was divided among them, giving them about $40 each, and putting them in considerably better humor. This cleanup was the result of only a short run. Some splendid rock has been sent down from the mine lately, and the men say there is plenty of it in sight to bring the owners of the mine out all right.

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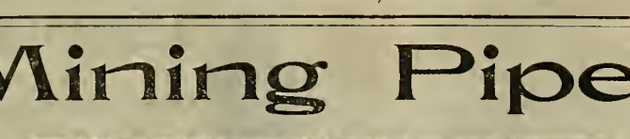

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Electrical Progress.

Electrical Rapping and Talking Table.

In a receut uumber of *Der Stein der Weisen*. Vienua, is described an ingenious piece of electrical apparatus that is withiu the power of any clever workman to construct. The following translation of the description is from the *Literary Digest:*

The varied applications of electricity in the present day surely put to the blush the deeds of wonder of the old magicians, as well as those of the modern prestidigitator. In the following paragraphs a piece of electric apparatus for an entertainment in parlor-magic will be described, namely, a rapping and talking table. It is an ordinary small table or stand with a rather strong top, having in the middle a circular hollow surrounded by a ring-shaped one. The whole is covered with a plate of wood about one-eighth of an inch thick. The foot of the table is hollow, and has at its lower end a little chamber in which is hidden a Leclanche element, aud which is accessible by means of a lid. From the battery two wires lead to two springs; these agaiu press against two half rings of metal, which are so fastened inside the top of the chamber that when the element is iu action there will be au electrical contact with them. They are in connection with two wires that lead from the foot of the table upward. One of these wires is connected to a notched metal ring that lies in the ring-shaped hollow on the table-top; the other connects with one eud of an electro-magnet coil in the middle of the table-top. The other end of this coil is in electrical contact with a flat metal ring that is fastened to the thin wooden cover of the table-top directly over the notched ring, without touching it. If the open hand be now placed on the thin wooden layer directly over the two rings, the electric current will be closed and the electro-magnet will attract its armature, which is fastened to the thin layer. This makes a loud rap, and when the current is broken there is au other rap. Of course the movement of the hand must uot be perceptible.

Each of the wires that lead upward through the leg of the table is also connected with a longer wire that leads through the lower end of the leg. Both of these are so arrauged that they may be led underueath a carpet or rag and connected to a telephonic transmitter in another room. If the transmitter be uow spoken to, the table will serve as a telephone receiver and reproduce the words, of course, much to the mystification of the uniuitiated.

Replace Lamps Often.

Users of the incandescent electric light should avoid the idea entertained by many people that the value of lamps depends entirely upon the number of hours they will burn. Some lamps last a long time beyoud their allotted life, and it is economy to promptly break all incandescent lamps after they have burued for a certaiu number of hours. A "three-watt-per-candle" lamp of recent constructiou may be started at a voltage sufficient to derive 16 c. p.; and, after burning from 50 to 100 hours, the c. p. will increase with the same pressure, or voltage, to seventeeu candles or over. From this poiut—say ninety hours—the c. p. of a lamp decreases gradually until, after burniug 500 hours, it has probably fallen to about eleven candles. This decrease in c. p. is not due to blackening of the bulb, which sometimes takes place, but to entirely different causes. If the voltage be increased to obtain an illumination of twenty to twenty-five candles from a 16 c. p. lamp, the probability is that the lamp started at 20, will rise to 21 c. p. iu about fifty hours, then gradually falls to eleven candles iu 450 hours, and will probably give out altogether in about that length of time. The lamp started at twenty-four candles, will rise to twenty-five in about tweuty-five hours, then fall to seventeen candles in 100 hours and to thirteen candles and fail in 200 hours. A voltage not above the capacity of a lamp is then the most economical, and it is better to break a lamp at 300 hours when it gives 13 c. p. than to run it 200 hours longer and have the light fall from thirteen to eleven candles. The expenditure for power thus wasted would much more than pay the increased cost of a liberal use of lamps.

The ordnance department of the United States Navy has, it is said, practically determined to operate the guns and turrets of some of its ships by means of electricity for the futnre. It is not yet intended to actually displace steam by the new motive power, but to so place it that in case of accident it may be switched on, and thus prevent the gun being thrown out of action. It is a wise step to make electricity at first only accessory to steam; but that, on the whole, electric motors are a preferable means of working guns has been determined after a series of experimeuts, the stringency of which was intended to bring out weak points if such existed. The advantages of the system are considered to lie in the greater simplicity of electric conductors compared with steam pipes, both as regards the ease of carrying them round bulkheads and the smaller surface exposed to injury, together with the facility with which they cau be repaired. Chief of all advantages is cousidered the greater simplicity of manipulatiug the controlling switch as against steam valves. A single lever, according to the system devised by Captain Samson, effects the operations of training and elevating.

Sunlight cau be produced on the earth at will, according to Nicola Tesla, the eminent electrician. He says that the light of the sun is the result of electrical vibrations in the 94,000,000 miles of ether which separate us from that great lumiuary, and does not proceed from a great central fire, as the scientists have all along held. If these vibrations can be produced the light will follow. The rapidity of the vibrations in a second necessary to produce desired result is, he says, expressed by the figure five with fourteen ciphers annexed; and he is now trying to build a machine which will produce these vibrations. The attempt will be of considerable scientific interest, whether carried to a successful issne or not.

The Chicago *Times* says: "More than one-half of the jangling of telephoue bells will be silenced iu Chicago during the next six months. Within that time the Chicago Telephone Company will have placed in operation its uew system of signals. A person using a telephone will be able to reach the one with whom he desires to talk, say what he wauts to and end the conversation, all without the jangling of a bell. The sigual to the operator in the exchange will be given by flash lights from an electric lamp."

A paper recently read by J. A. Baylis before the Can. Elec. Association deals eutirely with the electrolytic corrosiou of underground pipes and electrical conductors by stray earth currents. The remedies which Mr. Baylis suggests are: Grounding positive pole of dynamo and putting the negative to the liue; breaking metallic continuity of the pipes and cables; frequent reversals of polarity of the street railway current. But eveu these are uot thought to prove wholly corrective of the trouble.

Electricity has now beaten the record of the goldbeater, and can produce a foil of the metal from five to ten times thiuner than ordinary gold leaf. Joseph Wilson Swau, the well-kuown chemist of electric-lightiug fame, has presented to the Royal Society specimens of this wonderfully thin foil made by depositing gold on copper with the electric current and then dissolving away the eopper from it with perchloride of iron.

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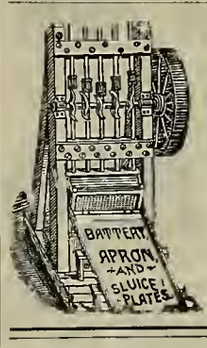

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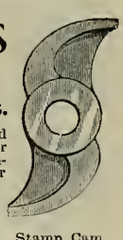

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New Land Office Rulings.

The Secretary of the Interior has recently rendered the following new decisions:

First—Land embraced within the claim of a qualified settler at the date a railroad grant becomes effective and is excepted by such claim from the operation of the grant.

Second—Evidence of voting will raise a presumption of citizenship, as fraud on the part of the voter is not to be presumed.

Third—The sale of a soldier's additional homestead right and attempted transfer thereof by power of attorney, to locate the right of said certificate, is made good in the hands of the purchaser by the act of August 18, 1894, and such purchaser is accordingly entitled to the possession of the certificate.

Fourth—Timber and land entries made for speculative purposes are fraudulent and will be canceled.

Fifth—In the investigation of a case where fraud is alleged against an entryman, proof of other acts of similar nature done contemporaneously, or about the same time, is permissible to show such extent.

Sixth—Repayment of fees and commission may be allowed where the entryman, to avoid conflict resulting from an error in the local office, in good faith, relinquishes his entry and takes another tract.

Seventh—A deserted wife may make a homestead entry, with credit for previous residence on the land, where her husband's entry thereof is canceled for failure to make final proof within the statutory period.

Eighth—A joint entry cannot be allowed where there is but one residence and set of improvements maintained and occupied in common by the parties, with the intention to take separate tracts when the land is open to entry.

Ninth—The possession and occupancy of a tract by a qualified settler at a definite location of a railroad grant, serve to except the land covered thereby from the operation of the grant, even though the settler at such time supposed the land belonged to the railroad company.

Tenth—The expiration of a pre-emption filing without final proof and payment, will not alone be accepted as proof of abandonment of the settlement claim at such time so as to relieve a railroad grant therefrom.

Irrigation Run Wild.

The *Irrigation Age* contains some entertaining correspondence. It appears that a Mr. Young wrote an article for the above paper under the title of "The Mighty Colorado and Its Irrigation Possibilities," which article contained some statements remarkable enough to stir up R. B. Stanton, who happens to know something about the Colorado, as well as the country in question, and Mr. Stanton replies to Mr. Young at some length. Mr. Young says that there are millions of acres awaiting irrigation and suggests that where this land is shut in by high ground, tunnels and siphons could be used, which is a simple suggestion to make. He proposes that a dam should be built somewhere along the course of the Colorado and its waters diverted into Death valley, filling that valley and reclaiming the surrounding desert. A map given by Mr. Young locates definitely the position for the dam, and the course of the canal and the country to be irrigated. An examination of the contour maps of the United States Geological Survey discloses some interesting facts. It shows that the proposed canal would be 150 miles long, and that, as high land with several mountain ranges lies between the Colorado river and Death valley, the canal may be made with only one through cut. This, however, would be 150 miles long and have a maximum depth of 2500 feet. Mr. Young suggests, however, that a tunnel might be used which would be only 125 miles long. To get the water from Death valley to the various tracts to be irrigated would require only two more open cuts, one of 50 miles and another of 150. Mr. Stanton suggests that it would be folly to stop there, but the canal should go straight on through the Sierra Nevadas and turn the surplus water into the San Joaquin valley, which would take only one more tunnel about 125 miles long.

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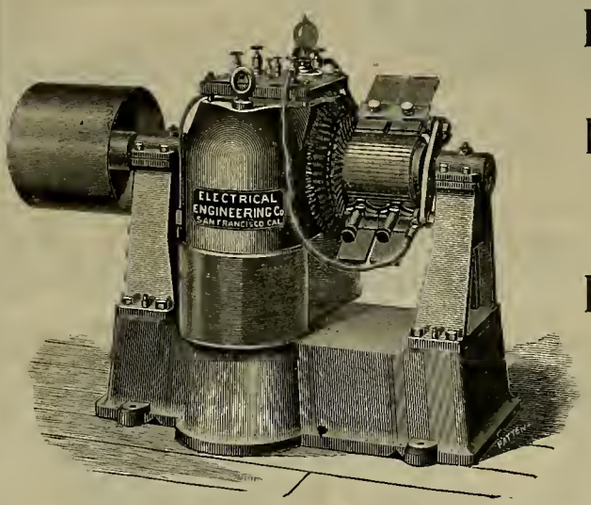

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Market Reports.

The Markets.

SAN FRANCISCO, Feb. 7, 1895.

The prophesy that "silver will advance before long" is still deferred in fulfillment, though the trend of events and the working of natural laws insure its realization. Free coinage of silver—the new British trade dollar—is reported from Bomhay, and it is predicted that the East Indian mintage will supplant the rupee. Meanwhile, another bond issue is announced from Washington, the pouring of water through a sieve being still considered statesmanship there.

There was a slight decrease in metal prices during the week, as shown below.

New York Metal Market.

NEW YORK, Feh. 7.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.
COPPER—Brokers', 9⅝c; exchange, 9.80c.
LEAD—Brokers', $3.02½; exchange, $3.12½.
TIN—Straits, 13¾c; plates, ——c.
SPELTER—Domestic, $3.20.

New York Prices.

NEW YORK, Feh. 7.—Following are the closing prices for the week:

	Silver in—			
	London.	N. Y.	Copper.	Lead.
Friday	27⅞	59⅞	10 00	3 00
Saturday	27½	60	10 05	3 02½
Monday	27½	60¾	.....	.....
Tuesday	27⅞	60	.....	.....
Wednesday	27⅝	59⅞	10 05	3 02
Thursday	27⅝	60	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½c
New York Telegraphic Transfer	15c
London Bankers' 60 days	$4.86
London Merchants	$4.86
London Sigbt Bankers	$4.90
Refined Silver, per ounce	60
Mexican Dollars, nominal	48½@49

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sheatbing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per hx	5 25	@	5 50
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
Englisb, lb	14	@	16
NAILS.			
Wire			$2 90
Cut			2 65
PIG TIN.			
Per lb	17	@	—
ZINC.			
Sheet	8¼@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do. "		"	1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			12 50
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	12 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, Feh. 7, 1895.

A drop in the early part of the week, caused in part hy the unfavorable weekly report, temporarily satisfied the bears, the market heirg at the mercy of any determined influence either way. At the delinquent assessment sale of the Ophir hut 120 shares were offered for sale.

The Standard Con. M. Co. holds its annual meeting on the 18th. The Bulwer Con. assessment is delinquent next Friday. The Con. Cal. & Va. declares a $54,000 dividend to-day. The De Lamar Mining Company of Idaho, owned and operated hy English capital, has paid a dividend of 1s per share in London. The amount is $100,000, and is at the rate of 20 per cent per aunum.

During the month of January the sales of mining stocks at the San Francisco Board amounted to 641,000 shares.

Mining assessments falling delinquent this month amount to $73,608, of which Nevada mines want $60,108, California $8500, and Mexican mines $5000.

The following shows the cash balances of some of the mining companies on the 4th inst.:

Alpha	$7,275	Hale & Norcross	$24,401
Alta	5,982	Justice	668
Andes	6,703	Kentuck	4,404
Belcher	3,007	Lady Wash'n	2,335
Best & Belcher	18,134	Mouo	4,935
Bullion	2,713	Mexican	19,423
Bulwer	3,090	Navajo	3
Bodie	14,640	Nevada Queen	233
Caledouia	3,477	Occideutal	155
Challenge	670	Ophir	13,910
Chollar	6,853	Overman	8,548
Church	8,697	Potosi	22,522
Con. Imperial	1,139	Savage	10,118
Confidence	776	Scorpion	1,132
Con. New York	1,002	Seg. Belcher	409
Cou. Cal	137,323	Silver Hill	1,915
E. Sierra Nevada	236	Silver King	1,047
Exchequer	2,618	Sierra Nevada	1,975
Gould & Curry	1,315	Standard Con	48,713
Grand Prize	971	Union Con	16,932
Gray Eagle	1,377	Utab	2,605

During January there were disbursed to employes in Virginia City sums as follows: Hale & Norcross, $2616.50; Andes, $900; Con. Cal. Va., $10,595; Mexican, $2133.75; Ophir, $3677.75; Best & Belcher, $2379; Gould & Curry, $1432; G. & C. and B. & B. shaft, $124; Alta, $2223.75; Savage, $2754; Justice, $1300; Crown Point, $7798.66; Yellow Jacket, $2733; Confidence, $90; Challenge, $90; Belcher, $3198; Seg. Belcher, $590; Chollar, $5059; Potosi, $2476; Union Shaft, $2841; Ward Shaft and Bullion, $714; Sierra Nevada, $811; Alpha and Exchequer, $726; Occidental, $900; Silver Hill, $245; West Con. (estimated), $1800; Nevada Mill (estimated), $2500; Electric Light (estimated), $500; Water Company (estimated) $3000; Quartz Mills (estimated), $10,000; total, $77,158.41.

The following illustrates the changes of the week:

MINES.	31	7
Alpha	$ 10	$ 08
Alta Consolidated	39	38
Andes	32	30
Belcher	42	38
Best & Belcher	88	.....
Bodie	.....	85
Bullion	12	.....
Cballenge	34	.....
Chollar	.....	39
Confidence	.....	70
Consolidated California and Virginia	3 40	2 95
Consolidated New York	.....	.....
Crown Point	46	.....
Excbequer	.....	04
Gould & Curry	34	30
Hale & Norcross	78	76
Justice	19	.....
Mexicau	78	74
Ophir	1 65	1 40
Overman	17	.....
Potosi	.....	45
Savage	47	.....
Sierra Nevada	45	.....
Union	53	46
Utah	05	.....
Yellow Jacket	49	.....

San Francisco Stock Board Sales.

SAN FRANCISCO, Feb. 7, 1895.

9:30 A. M. SESSION.

400 Alpha	08	400 Ophir	1 40
500 Alta	38	100 Potosi	45
100 Andes	29	500 Seg Belcher	06
300 Belcher	38	100	07
600 Con Cal & Va	2 95	200 Union	46

SECOND SESSION—2:30 P. M.

100 Alta	37	100 Confidence	70
100 Andes	29	1000 Exchequer	04
50 Benton	60	100 Gould & Curry	30
100 Bodie	85	100 Hale & Norcross	76
1350 C. C. V	2 90	100	75
20	2 95	150 Mexicau	74
100 Chollar	39	100 Occidental	05
1000 Con. Imperial	01	600 Ophir	1 40

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JANUARY 29, 1895.

533,344.—VEHICLE SPRING—A. W. Burdick, Fresno, Cal.

533,056.—SCAFFOLD—Cruson & Robkins, Lebanon, Ogn.

533,168.—LAMP STOVE—Furrey & Hollman, Los Angeles, Cal.

533,124.—SAWMILL OFFSET—D. B. Hanson, S. F.

533,195.—DENTISTS' TOOL—A. P. Hays, Los Angeles, Cal.

533,367.—SPRAY NOZZLE—J. McBoyle, Oakland, Cal.

533,142.—TELEPHONE—Sabin & Hampton, S. F.

533,400.—AIR INJECTOR—J. W. Stanley, Oakland, Cal.

533,380.—SEWING MACHINE—G. W. Stewart, Chehalis, Wash.

533,102.—GAME—Mary Thomson, Los Angeles, Cal.

23,962.—DESIGN—PIN HOLDER—E. H. Ellis, Pasadena, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

A Word of Caution.

Tbe necessity of keeping close watch over mining claims and of taking all legal steps to perfect title has been shown in the Coulterville district lately. In one instance a mine (patented, we believe), upon whicb a mill was in operation, was jumped, and several instances are reported where claims have been "appropriated." There are men who will resort to almost any means to secure desirable claims; and even though tbeir efforts do not win, tbe owners are put to considerable expense. A claim is never safe until it is patented; and if a claim is worth holding, it is worth patenting. It is a matter of neglect with most men tbat tbey have not secured patents, but it is liable to prove a dangerous oversight. Now that so many new men are in the country, the likelihood of trouble from this source is increased. It will prove the part of wisdom for every man who has a good mine to secure a patent as soon as possible.—Mariposa Gazette.

South Africa's Gold Output.

The December output of tbe Rand was 182,104 ounces, the highest on record, beating that of September (the previous best) by 5,397 ounces, and tbat of December, 1893, by 35,747 ounces. The year's production is 2,024,159 ounces, an increase of 545,686 ounces over 1893. Tbe magnitude of the December output is partially explained by the inclusion of "sweepings," due to the aunual cleaning up of chlorination plants, and so-forth, wbich made an addition of close on 2500 ounces to the production of the Robinson alonc. Tbe output of January will probably show a reduction in consequence of the absence of these "sweepings," and, besides, the Geldenbuis estate, yielding over 6000 ounces a month, has suspended crushing in order to add to its battery power. On the other hand, one or two other miues are now crushing with an increased number of stamps.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

AIR INJECTOR AND OIL BURNER.—James W. Stanley, Oakland, Cal. No. 533,400. Dated Jan. 29, 1895. This invention relates to a device for hurning oil and combining with it jets of air and steam. It consists of a series of independent separahle air-supply nozzles, a jet tuhe through which steam is delivered centrally through said nozzles and an oil-supply device, with a means for heating the same before it is delivered into the injector. The nozzles have their hases enlarged at right angles to the line of their projection, each of said chambers having a rearward extension hy which it is fitted into the next adjacent one. A cap or casing is fitted to the rear of the nozzle, having a central steam pipe and discharge nozzle aud an annular oil chamher is fitted within the cap around the steam pipe, having a passage through which oil is admitted to one side and a discharge pipe on the other through which oil is delivered into the line of the steam-discharge jet. The oil is heated by the steam and is discharged with the steam, while the air admitted through the series of nozzles assists in the perfect comhustion of the whole.

SPRAY ATTACHMENT FOR NOZZLES.—Joseph McBoyle, Oaklaud, Cal. No. 533,367. Dated Jan. 29, 1895. This device is an attachment for water-discharge nozzles and is used to produce a spray especially adapted for irrigating purposes. It consists of a perforated plate adapted to slip over the end of the nozzle, having the lower part hent at right angles with the perforated portion, a spring clasp projecting upwardly from this part in line with the perforation, so as to clasp the end of the nozzle, a plate adjustahly attached to the outer end so as to be turned more or less to intercept the stream of water discharged from the nozzle. This plate has a rounded end and the surface of it is grooved or corrugated so that when the water strikes it it will he dispersed in a fine spray. The plate may he raised or depressed to change its angle and the device is provided with a means for holding the plate in any desired position.

Assessment Notices.

GOULD & CURRY SILVER MINING COMPANY—Location of principal place of business, San Francisco, Cal.; location of works, Virginia, Storey county, Nev.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 17th day of January, 1895, an assessment (No. 75) of fifteen cents (15c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 19th day of February, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the 12th day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. BURROW, Secretary.

Office—Room 69, Nevada block, 309 Montgomery street, San Francieco, Cal.

REED MILL AND MINING COMPANY—Location of principal place of business, San Francieco, California. Location of worke, Ferguson Mining District, Helene, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 31st day of December, 1894, an assessment (No. 1) of two (2) cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 33, tenth floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESHAY, the 3d day of April, 1895, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

By order of the Board of Directors.

JOHN H. ISHAM, Secretary.

Office, Room 33, tenth floor. Mille Building, San Francieco, California.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia district, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 21st day of January, 1895, an assessment, (No. 44) of 10 cents per share was sold on THURSHAY, the 21st day of March, 1895, levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 21, No. 331 Pine Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of February, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. K. GRAYSON, Secretary.

Office, Room 21, No. 331 Pine street, San Francisco, California.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal places of business, San Francisco, California; location of works, Inyo, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 21st day of January, 1895, an assessment (No. 26) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 15, third floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 5th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. W. SARGEANT, Secretary.

Office—Room 13, third floor, Mills Building, San Francisco, California.

BUMBARTON LAND AND IMPROVEMENT COMPANY.—Location of principal place of business, San Francisco, California. Location of works, in the counties of Alameda and Santa Clara, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 22d day of January, 1895, an assessment (No. 7) of 12½ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 214 Pine street, room 55, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent, and advertised for sale at puolic auction, and unless payment is made before, will be sold on THURSDAY, the 21st day of March, 1895, to pay the delinquent assessment, together with coste of advertising and expenses of sale. By order of the Board of Directors.

JABEZ HOWES, Secretary.

Office, Room 55, 214 Pine Street, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from W. Thomas et al., in the Central Hill Mine, Douglas Flat, Calaveras Co., Cal., to impound tailings behind stone dams in ravines; from Giovanni Rossi, in the Kate Gray Mine, near Volcano, Amador Co., Cal., to impound tailings behind log and brush dams below mine; from J. E. Newsom, in the Shealor Mine, near Volcano, Amador Co., Cal., to impound tailings behind log, rock and brush dam in Sutter Creek; from Giani Remartini et al., in the Rail Road Hill Gravel Mine, near Fourth Crossing, Calaveras Co., Cal., to impound tailings behind a dam on flat ground; and from John Slater, in his mine near Brownsville, Yuba Co., Cal., to impound tailings behind York Mining Co.'s dam, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Feb. 25th, 1895, at 1:30 P. M.

THE

Ore Deposits of the United States.

By J. F. KEMP, A. B., E. M., Professor of Geology, School of Mines, Columbia College.

Second Edition, Revised and Enlarged, New Illustrations.

A practical review of the ore deposits of this country. A valuable addition to up-to-date mining literature, of value to the Pacific coast. Sent postpaid upon receipt of price, $4.00. Address

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MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied	Delinq't and Sale.	Secretary.
Bullion M Co, Nev	44	10c	Jan 21	Feb 26, Mar 21	R R Grayson, 331 Pine
Bulwer Con M Co, Cal	10	5c	Dec 11	Jan 16, Feb 15	J E Jacobus, 309 Montgomery
Confidence S M Co, Nev	25	30c	Jan 9	Feb 13, Mar 6	A S Grotb, 414 California
Crescent M Co, Cal	1	10c	Jan 15	Feb 16, Mar 11	A K Durbrow, 309 Montgomery
Golden Eagle M Co, Nev	1	15c	Jan 8	Feb 28, Mar 4	E B Holmes, 309 Montgomery
Gould & Curry S M Co, Nev	75	15c	Jan 17	Feb 19, Mar 12	A K Durbrow, 309 Montgomery
Inyo Marble Co, Cal	26	10c	Jan 21	Mar 6, April 5	W W Sargeant, Mills Building
Reed M & M Co, Nev	1	2c	Dec 31	Feb 11, April 3	John H Isham, room 33, Mills Bldg.
Sierra Nevada S M Co, Nev	108	25c	Jan 16	Feb 20, Mar 11	E L Parker, 309 Montgomery
Standard Gravel Co, Cal	1	12c	Jan 25	Mar 4, Mar 22	W H Scbmidt, 207 East
Yellow Jacket M Co, Nev	58	25c	Dec 10	Jan 10, Feb 20	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Standard Con M Co	J W Pew, 310 Pine	Feb 18

Coast Industrial Notes.

During '94 1,163,432 tons of coal were mined in the State of Washington.

The Bay City Iron Works Co. has incorporated with a capital stock of $10,000.

The Risdon Iron Works are placing a 100-horse power boiler on the Osborn Hill mine at Grass Valley.

Tacoma, Wash., figures having saved $50,000 in '94 by municipal ownership of light and water furnished.

The subscriptions to the San Francisco and San Joaquin railroad scheme now aggregates nearly $2,000,000 in this city.

W. G. Dodd, of the Union Iron Works, has designed and will shortly put on the market the Dodd ore crusher and the Union concentrator.

The California Telephone and Construction Co. has filed articles of incorporation at San Jose, with a paid-up capital stock of $500,000.

A syndicate of capitalists is reported to have offered the Government $33,000,000 for its entire claim against the Union Pacific Railroad.

Eight Heady-Norbom concentrators were last week sent to the Grand Victory mine in El Dorado Co., and two to the Bald Eagle, Alaska, mine.

The sale of $42,000 bonds for a water system for Ballard, Wash., has been completed by the city council accepting the offer of a Boston house.

There are now in California 675,000 tons of wheat. The loss to the State by the depreciation in the price of wheat for the last three years aggregates $22,500,000.

The Redlands Electric L. & P. Co. will issue $100,000 in bonds, using one-half the proceeds in taking up the original issue and the other one-half in improving the plant.

The Mendocino Lumber Co. have cut the wages of their employes twenty per cent. This, they claim, puts the wages they pay equal to the rate paid during '94 by other companies.

The new "Gold King" amalgamator, manufactured by the Midas Gold-Saving Machinery Company of this city, is attracting much attention from practical mining men. Their headquarters are at 114 First street.

The largest drydock in the world is now under construction at Port Orchard, Wash. A large tract of land on Puget Sound, sixteen miles from Seattle, has been bought for the purpose, and the work of building is well under way.

The coast line of the S. P. R. R. has reached a point on the coast. The track has reached Pismo beach at the townsite of Grover the first place south of San Francisco where the road actually comes down to the ocean front. The work will be pushed forward without delay under the present contract, and through connection between San Francisco and Los Angeles will be made during the coming year.

Electric Elevators.

The Sprague Electric Elevator Company has just closed a contract with the Parrott Estate for the installation of fifteen electric elevators in the Parrott Building now being erected on Market street. Eleven of these elevators are high speed, and four are slow speed sidewalk elevators.

This contract is notable as being for the most extensive elevator plant in Ameriea, if not in the world. The selection of this type of elevator was based upon the highly successful results of six that were placed in the new Postal Telegraph Building, in New York City.

San Francisco has been slow in accepting the electric elevator, but confidence in it having been established, it bids fair to replaee the more expensive elevators now in general use.

PROSPECTING

Mechanics; Mechanical Drawing; Electricity; Architecture; Architectural Drawing and Designing; Masonry; Carpentry and Joinery; Ornamental and Structural Iron Work; Steam Engineering (Stationary, Locomotive or Marine); Railroad Engineering; Bridge Engineering; Municipal Engineering; Plumbing and Heating; Coal and Metal Mining, and the English Branches. Blowpiping outfit and mineral specimens *free* to students. Send for Free Circulars, stating the subject you wish to study, to

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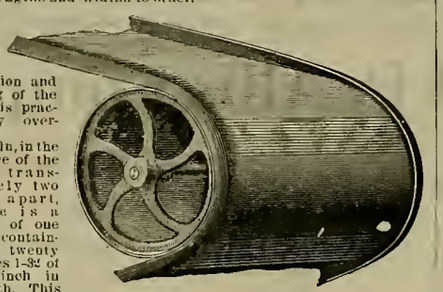
Will reclaim your waste oil and make it equal and often better than new oil. Will reduce your oil bills 50 per cent and save your bearings. In use with the largest and best plants everywhere. For prices and particulars, address

D. M. DOUB, 137 First Street, San Francisco, Cal.

Blasdel Improved Concentrating Belt.

We keep in stock belts suitable for the Frue, Triumph, Johnston and Tuffock machines, and make all lengths and widths to order.



Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.

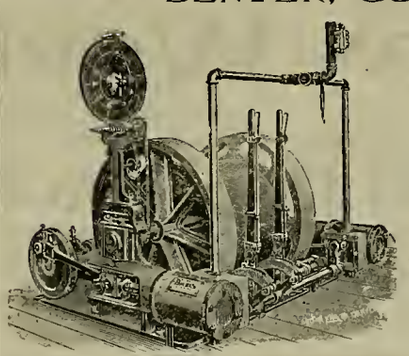
Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves the sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

H. G. BLASDEL, JR., Manager,

419 California Street, Haywards Building.....San Francisco.

Hendrie & Bolthoff Mfg. Co.,

DENVER, COLORADO.



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ESTABLISHED 1863

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RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

BOOKS ON ASSAYING.

By C. H. AARON.

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This work is written by an experienced metallurgist who has devoted many years to assaying and working precious ores on the Pacific side of the American Continent. He writes whereof he knows from personal practice, and in such plain and comprehensive terms that neither the scientist or the practical miner can mistake his meaning.

The work, like Mr. Aaron's former publications ("Testing and Working Silver Ores," "Leaching Gold and Silver Ores") that have been "successfully popular," is written in a condensed form, which renders his information more readily available than that of more wordy and less conscientious writers. The want of such a work has long been felt. It will be very desirable in the hands of many.

Table of Contents:—Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

The volume embraces 130 12-mo pages, with illustrations, well bound in cloth; 1889. Price $1.00 postpaid. Sold by the Mining and Scientific Press, 220 Market St., San Francisco.

Parts II and III.—Gold and Silver Bullion, Lead, Copper, Tin, Etc.

SECOND EDITION—PRICE $1.75.

This book is entitled "Assaying—Parts II and III," and is separate from part I, and treats of Gold and Silver Bullion, Lead, Copper, Tin, Mercury, Zinc, Nickle, Cobalt, etc.

Table of Contents:—Gold and Silver Bullion; Apparatus; Melting Bullion; Assaying Bullion; Humid Assay of Silver; Gay Lussac's Method; Volhart's Method; Manipulation; Lead Ores; Copper Ores; Tin Ores; Mercury Ores; Zinc Ores; Nickle and Cobalt; Chromium; Bismuth; Arsenic; Anthmony; Sulphur; Salt; Note.

One of the methods given for the Assay of Copper is new, original and exact, as is also one of the processes for Zinc.

The book contains 161 pages with illustrations, and is strongly bound in cloth. Much of the original text is replaced by new matter.

Price, postpaid, $1.75. Sold by the Mining and Scientific Press, 220 Market St., San Francisco.

Books on Working Ores.

BY GUIDO KUSTEL, M. E.

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AARON'S LEACHING GOLD AND SILVER ORES, the most complete hand-book on the subject extant; 164 pages, octavo. Illustrated by twelve lithographic engravings and four wood cuts. Fully indexed. Plainly written for practical men. In cloth, $3. Sold by THE MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

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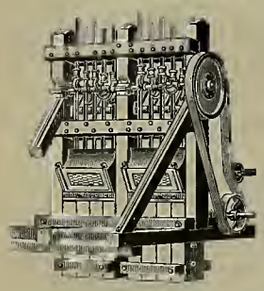

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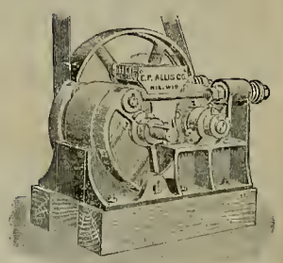
Etc., Etc.



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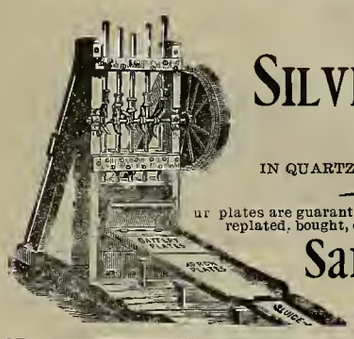

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VOLUME LXX. Number 7. SAN FRANCISCO, SATURDAY, FEBRUARY 16, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Dredging at Dayton

By the Carson River Placer Mining and Dredging Company—Recent Developments.

After some eight years of experimeut. aud at a cost of more than one hundred and twenty thousand dollars, the "Carsou River Placer Mining and Dredging Company" has at last demonstrated that river dredging for gold and silver beariug sulphurets, free metals—including gold. silver and quicksilver—metal bearing sliues from the mills, etc.. is no longer an experimeut, but. from a financial point of view, a decided success. The profits of labor to save these values by means of dredging, screening and concentration depend upon several factors, principally the following:

1. The number of tons of sand, or "pulp," that each concentrator will treat per day.

2. The number of concentrators used; the per cent of concentrates obtained from the pulp; the assay value of these concentrates, and the per cent of this value recoverable by milling or other processes of reduction.

3. The amount of free metal obtainable by amalgamation or other process, and the expense of the whole process of treatment.

The project of the Carson River Placer Mining and Dredging Company originally had for its object an effort to recover simply the quicksilver carried iuto the Carson river from the many mills that worked the ores of the famous Comstock lode. The following, taken from Vol. 4. page 117, U. S. Geological Survey, explains clearly the origin of the company:

"Milling.—In the early days of mining on the Comstock lode, considerable quantities of very rich aud complex ores occurred, and these were treated by washing aud barrel amalgamation. Later, the ores became more facile, and the system of pan amalgamatiou was developed and applied with success. For many years it has been found practical to beneficiate all ores met with by this process, with the aid of bluestone (cuprus sulphate) and salt.

"The success of the process is unquestionably due in a large measure to the chemical action of the iron. Formerly the mills guaranteed a return of sixty-five per cent of the assay value of the ores, but of late years seventy-two per cent is guaranteed, and above eighty per cent is often returned.

"On the whole, however, it is improbable that more than seventy-five per cent of the bullion contained in the ore has been recovered from it, and it is therefore fair to estimate that the ore received has contained at least $400,000,000, of which about three-quarters has reached the market.

"Competition aggravated the evils of scarcity, for as a fixed sum per ton was paid for milliug, it was to the interests of the custom mills to reduce as many tons per day, however imperfectly, in order to compete with one another at a profit. Guarantees of any arbitrary percentage of returns, based on the assay value of the ore, were rarely given, and unless the customer became disgusted with the scanty yield of bullion and withdrew his patronage, the mill owner cared little for the constant waste of metal in the slimes or tailings which were washed away directly or indirectly into the river. Thus the Carson flowed like Pactolus over precious sand, and its bed is lined with ores of varying thickness.

"It is not too much to say that one-third of the ore product, during the early years of mining on the lode, was lost in the production through carelessness, iguorance aud reckless competition."

Iu the spriug of 1893 the company, tired of years of expensive mismanagement and failures and of promises expeusively broken, sent to Dayton the general manager, Dr. O. H. Warren, of Syracuse, N. Y., a gentleman well versed in mechanics, prudent and thoroughly competent to master the task before him. i. e., to determine. beyond the question of a douht, if the values were in the river in sufficient quantities to pay, and, if so, could they be successfully recovered.

Dr. Warren's experiments showed that amalgamation was practically impossible, because of the amount of quicksilver contained in the river material, keeping the plates too moist, and that, for other reasons, blanket sluices were impracticable; so, one by one. all devices commouly used were discarded. until nothiug in use in ordinary milling and mining methods was found practical in this peculiar proposition except the single one of concentration. Then followed a long and exhaustive series of experiments and practical tests with the Woodbury and other standard coucentrators. Upon the results of these carefully couducted tests the estimate of the output of a plant of given capacity was computed, and it was shown, beyond a douht, that a plant of sufficient capacity would pay enormous profits. The Westeru department of the company was then entirely changed and reorganized, by the appointment

(*Continued on page 103.*)

PLANT OF THE CARSON RIVER PLACER MINING AND DREDGING COMPANY. AT DAYTON, NEVADA.

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Our latest forms go to press on Thursday evening.

J. F. HALLORAN.....General Manager

San Francisco, February 16, 1895.

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STRONG and numerously signed protests are being presented in the Legislature against the proposed tampering with the State Mining Bureau.

NOTHING is ever settled till it is settled right, and so long as the price of silver is set in London, so long will be delayed the proper adjustment of the silver question. There is a proposed combination of American interests to handle the silver product of the country in New York, which is a step in the right direction. It is anomalous and absurd if allowed to continue, that the country producing no silver should control the world's price of that metal. Of course, we are not unmindful of the causes, nor the facts; it is understood that the big purchasers of silver buy in London, and because of that it is in London the price is made. The system must be overturned, and the sales made and the price maintained in the country and by the country that produces the largest percentage of the white metal.

WASHINGTON PAPERS are trying hard to have a State Mining Bureau for that commonwealth, and point to this State as indicative of the value of such an institution. A Tacoma paper says: "The work now being done under the State Mineralogist of California, and in fact all the work done so far in that State by the State survey or State Mining Bureau, has been the greatest and most remunerative advertising which has ever been accomplished there. The annual report and the bulletins of recent publication are of the greatest value in advertising the mineral resources of that famous State." These and hundreds of other utterances are respectfully commended to the shortsighted statesmen or countysmen at Sacramento, who seek to destroy the only institution the California miner has, in the name of "economy."

SENATOR TELLER, of Colorado, has introduced a bill in the Senate to suspend that portion of the U. S. Mining law requiring the annual expenditure of at least $100 on a claim for the current year—a repetition of the "suspension of assessment" of '93 and '94. The PRESS favored such a law in '93, the first time it was proposed, it being represented that there was so universal a demand for such relief that it was in every sense a public measure. There was some opposition to it then, but it went through. In '94 it went through again, though the PRESS and other mining papers pointed out how one-sided and detrimental the result of the suspension was. It is only by results that laws or their suspension can be judged. The "suspension of assessment" has had a trial. It is a failure in the original intent, a detriment to the development of mining industry and an injury to every man who is in earnest as to the working or life of his claim. For these reasons the PRESS opposes any suspension of assessment, believing such legislation to be against the real interests of the real miner. It would be against public policy and the public good to repeat in '95 the mistake of '94 and '93.

The Debris Commission.

From the time of the adverse decision till March, '93, hydraulic mining in California, except on tributaries of unnavigable streams, was under a ban. After years of effort and untiring struggle a bill was passed by Congress two years ago legalizing hydraulic mining in this State and prescribing the conditions and requirements under which it could be carried on. The bill which thus legalized the rehabilitation of one of California's greatest industries was a compromise measure, and, as passed, was not wholly satisfactory. Some of the hydraulic miners, from the tone of court decisions in '92, thought they could get along without such a law. Some of the valley residents wanted to see no dams, no hydraulic mining. But the passage of the law was of great benefit to all classes alike; it settled a long continued dispute; it made easy way for the working of the mines; it allowed renewed output of gold; and, above all, it put the control of the matter into the hands of men above local, sectional or personal prejudice—men skilled, impartial and exact, unbiased and independent; the provisions and enforcement of the law being vested in a U. S. Government Debris Commission, composed of distinguished members of the United States Engineering Corps.

In '88 U. S. engineers made a report to Congress on hydraulic mining in California; on the basis of that report the Cal. Miners' Association worked for the passage of a bill, and when the act of '93 passed, United States engineers thoroughly familiar with the subject were appointed. Col. Mendell, Lieut.-Col. Benyaurd and Major Hener, members of the original Debris Commission, were constituted the United States Debris Commission with power to interpret and enforce the law regarding hydraulic mining in this State.

It may be said here, parenthetically, that shortly after the passage by Congress of the bill creating the U. S. Debris Commission, the Legislature of this State passed a bill authorizing the Governor to appoint a State Debris Commissioner, and appropriating $250,000 to be used in the construction of restraining works for the purpose of restraining mining debris, such appropriation, however, not to be available till Congress appropriate at least an equal amount. Gov. Markham appointed a State Debris Commissioner, but the failure or neglect of the general Government so far to appropriate money for the purpose indicated has made the State appropriation inoperative.

The State and general Government having thus been formally and almost unanimously committed to the policy of rehabilitating hydraulic mining in the State, the work began. The gentlemen comprising the board were given in such appointment considerable extra work, without any increase in compensation. After some correspondence with the Secretary of War, and it being apparent that the appointments were not civil commissions, but under the head of "army regulations," the Commission organized June 8, '93, established headquarters, elected officers, and promulgated its rules. Though the additional duty was unsought, onerous and manifestly unwelcome, the members of the U. S. Debris Commission have promptly, cheerfully and indefatigably performed all duty pertaining to the position, and have done a great deal of hard work. The bill creating the Commission appropriated $15,000 for its maintenance. Out of this meager amount the Commission has paid its expenses since its creation; but though an appropriation has been suggested more than once by the Commission, none is forthcoming, and unless such appropriation is made by Congress the active work of the Commission cannot continue.

The matter has been referred to in the above to place the salient facts in the case before the public. It goes without saying that the Commission has been of material benefit to California. It is a continuous body, the act creating it places no limit to its duration, and the $15,000 appropriated was merely meant for its immediate and initial expenses. The $15,000 was manifestly intended to tide over temporary requirements, but the continuous financial needs of the Commission have evidently been overlooked.

Congress adjourns by limitation on March 4th, and if anything is done before adjournment it must be projected at once. The Cal. Miners' Association, to whose unremitting efforts the existence of the Commission is largely due, has barely time to effectively direct the attention of Congress through our State delegation to the possibility of getting an adequate amount in the general appropriation bill.

During '94 the Commission received over one hundred petitions for permission to resume hydraulic mining, about three-fourths of which were acted on affirmatively; the gold yield from those so reopened should aggregate over half a million annually. The one hundred petitions received do not represent one-fourth the number of hydraulic mines operating in the State when the Sawyer decision shut them down, nor one-tenth the number that can and will operate under the auspices of the Commission and by reason of its authority. While the Commission cannot perish or be abrogated except by Congressional action, yet without Congressional appropriation it would be powerless to perform the work assigned to it. This is a matter of such manifest importance to the mining industry of the State that it demands immediate and earnest attention.

California has always been modest, too modest, in its requests of the federal Government. In the thirty years between '48 and '78 California gave to the world $1,185,550,000 in gold; since then she has contributed $224,000,000 more. It would be simple justice for the United States Government to appropriate the meager amount required to properly and permanently place the hydraulic mines of the State in position to pour out a perennial stream of gold aggregating more than the thousands of millions already yielded; it would be in order to place for immediate use the $250,000 contingent upon which an appropriation of that amount for that purpose was made by the State, and it is certain that if the few paltry thousands needed to keep the Debris Commission up to its present high state of efficiency be asked for it will be promptly forthcoming. It is evidently more a matter of negligence than intent to withhold that has occasioned the present probability of a check to the usefulness of that body. No State in the Union has given so much or got so little.

On this topic U. S. Senator Perkins says: "We have not been fairly dealt with. In the dark days of this country, when we did not know whether our Government was to be maintained or not, it was the gold dug from the mines by California miners that maintained the credit of the nation."

Ex-Congressman Clunie says: "In war times, when the lamented Lincoln presided over the destinies of this great nation, he called upon California, which responded with millions of dollars taken from our State treasury and given to the nation, to be returned at the close of the war. I found that upwards of $3,000,000 had been advanced by this State for that purpose, and that not one dollar had ever been returned to this State. I gave a year's time to this; went over all the vouchers, and every public official that examined them agreed that they owed this State upwards of $3,000,000, not counting any interest. I prepared a bill; it was submitted to the committee, unanimously approved and reported, but the appropriations were already made up and it had to go over to another Congress."

That is as far as it ever got. The money is still due. Anything that California asks from Congress is but a small percentage of what is rightly her own. The United States concedes it owes this State $3,000,000, and has owed it for over thirty years. This is a question that transcends the limits of this article, but enough has been said to illustrate the necessity and justice of immediate appropriation for the support of the United States Debris Commission.

A DENVER paper says that the assayer in charge of the mint at Denver, to whom was assigned the duty of collecting the statistics of the Colorado production of gold and silver for 1894, in his report to the directors of the mint, places the production of gold at $10,616,400, and silver 23,748,000 ounces, which, at the average price of silver for the year—63 cents per ounce—was worth $14,961,000, the coinage value of the same being $30,704,500. The increase in gold production for the year over '93 was $3,000,000, which illustrates the great mineral wealth of Colorado and the unusual attention given to gold production. The gold statistics of California for '94 are not yet complete, but it is thought the aggregate will not be far short of $14,000,000.

Concentrates.

ANTIMONY ore is being shipped to this city from Havilah, Kern Co.

NEVADA COUNTY papers say the reported Osborn Hill-Orleans deal is off.

THE *Courier* says that inside of ten years Prescott will be a second Denver.

THE Bullion-Beck (Utah) mine declared another $25,000 dividend on the 5th.

A 100-TON CAPACITY SMELTING WORKS is to be shortly built at Allerton, New Mexico.

THE Gover mine, in Amador Co., is to be sold, and the indebtedness paid this month.

A. CARRIGAN, of Dunham, Carrigan & Co., is developing the Badger Hill, Nevada Co., mine.

E. B. GAGE is reported to have bought the Congress mine at Congress, Arizona, for $1,000,000.

E. BECKMAN, of Santa Barbara, is about to build a mill on the property at Bland, New Mexico.

UP to date Capt. Bradford, of Utah, and his wonderful new gold process have not materialized.

H. C. BOONE has bonded his mining claims at Carlisle, Arizona, to an English syndicate, for $80,000.

ONE HUNDRED MEN are employed at the Virtue mine, Baker Co., Oregon. The monthly output is $20,000.

SOUTH DAKOTA prospectors say that "every ore chute or deposit (other than gravel) has its vertical."

Two new gold quartz mills are talked of at Carr Fork, Bingham district, Utah, to be built as soon as weather permits.

THE Boston and Montana Co. propose to put up the largest quartz mill in the State—300 stamps—on their Mariposa county property.

THE West Fork Placer Gold Mining Company, Madison county, Montana, will expend $50,000 in development work in the spring.

WORK at the Giant King mine, near Washington, Cal., is reported suspended till the rock can be tested for its value by mill process.

A HARQUA HALA miner says: What we ought to do is to survey all our claims because things are getting badly mixed in this camp.

THE Lakeview Consolidated Gold and Silver Mining Company, Beaverhead county, Montana, has incorporated; capital stock, $500,000.

THE Alaska M. & M. Company, of Pike City, Sierra Co., has bought the Grizzly quartz claim and will work it in conjunction with the Alaska.

THE Cariboo Mining, Milling and Smelting Company, of Spokane, Wash., has increased its capital stock to $800,000 and declared an $8000 dividend.

PINACATE DISTRICT, Riverside Co., is reported producing from $30,000 to $50,000 in gold, and paying out for labor and supplies $10,000 per month.

THE *Record* hears that a half interest in the Tom Boy Gold Mines Company of Telluride, Col., is about to be placed with English capitalists at $750,000.

THE Argus Gold Mining Co., of Cleveland, O., have bought several locations in Snows canyon, Modoc district, Inyo Co., and propose building a 20-stamp mill.

THE total ore shipments, up to January 24th, from Kootenay, were 1302 tons, value $171,900. In Trail creek two mines are shipping at the rate of $150,000 a month.

CHICAGO MEN have bought the Mountain View mine, forty miles from Fresno, for $100,000. A 20-stamp mill, concentrators and complete chlorination plant will be put in.

THE fact that as depth is attained the Clear Creek, Colorado, silver mines are changing into gold mines is another illustration of the fact that "History repeats itself."

A MINING revival is reported from the Panamint mines, southern Inyo Co., which have been sold to W. Remsen, P. A. Graff and Y. D. Dechert, of New York city.

MINERS and others living at Picacho, on the Colorado river, have in public meeting organized and formed the old Picacho mining district, opposite Eureka on the Colorado river.

THE Spokane, Wash., Hydraulic Placer Mining Company have elected a new set of officers and will resume work on their ground near Murray, Idaho, at an early date in the spring.

JACK ROUSE, who with two partners located a quartz mine in the vicinity of the Alaska-Treadwell mine on Douglas island, Alaska, is reported to have been offered $75,000 for the property.

THE Jones Creek Mill and Mining Co. has incorporated at Crescent City with an $80,000 capital. J. McLaughlin, E. Courmesford, W. Smith, E. A. Work and P. Emetsburg are directors.

THE Pinon Mining and Milling Co. incorporated in this city this week with a capital stock of $20,000,000. W. M. Sent, A. K. Durbrow, J. F. Millner, J. Fay and W. C. Stadtfield, incorporators.

THE adobe bricks, of which an old building in Sonora, Tuolumne Co., was constructed, are being pulverized and washed in sluice boxes for the gold they contain. The *Democrat* says good pay is realized.

MR. W. G. RIFENBURG, of San Diego, is in the city buying machinery for his placer mines in southeastern Nevada, near El Dorado canyon. It will be freighted from Kingman, Arizona, 100 miles from the mines.

THE Evening Star Mining Co., of Grass Valley, are discussing whether to put in new and heavier machinery or cease development. The present indications in the mine warrant a continuance of work.

THE Silver Plume, Col., *Standard* reminds the local chroniclers that the sending out of exaggerated reports is not the best way to boom a camp. It may fool somebody for a time, but finally the camp comes to be regarded with suspicion, and if anything really good is found it is hard to convince the public that such is a fact. If the truth is not sufficient to attract attention it is better not to say anything.

THE Montana *Missoulian* asserts solemnly that "Montana produced $43,000,000 in gold last year." An alleged mining paper published in Los Angeles says Colorado's gold yield was greater than that of California in '94.

WITH favorable silver legislation Butte, Montana, would have in operation 300 paying mines. There are a great many mines being worked at present, but the larger portion of them are copper and gold properties.

THE statement of the San Diego correspondent of the Los Angeles *Times* that the Golden Cross mine had been sold for $1,000,000 is denied in Yuma, where it is said the mine is worth vastly more than that amount.

A COMPANY has been organized in Montana to work placer mines on the Yahk river. The company owns ground about half way from the falls to Snipetown and on a bar above the mouth of the Yahk on the Kootenai river.

THE Grass Valley *Union* says E. E. Matteson, whom it styles "the inventor of hydraulic mining," is an inmate of the Nevada Co. hospital. It says he was the first person to use a canvas hose and nozzle in hydraulicking gravel claims.

A CARLOAD of pig tin, amounting to 322 bars, passed through San Antonio, Texas, last Sunday, consigned to New York from mines near Durango, Mexico, and said to be the second shipment of tin ore ever mined on the American continent.

J. D. DE LAMAR is reported to have sold his mines in southwestern Idaho for $2,000,000 to Paris capitalists, the proceeds to be used in developing his mines at De Lamar, Nevada, and aiding in the construction of the pending railway through Lincoln Co., Nevada.

THE Buttes mine, near Sierra City, is reported shut down on account of lack of water. Superintendent Thomas has given a crew of men a contract for $500 to bring the water in to the mine. There are about five miles of flume and one mile of ditch to shovel out.

THOS. JONES, of Henley, tells the *Journal* he can't keep enough mining location blanks on hand, from the constant locations made, since the discovery of the great porphyry dyke extending from the mouth of the Shasta river almost up to the Oregon boundary.

THE usually correct "Ores and Metals," of Denver, reports a find of platinum at Laramie, Wyoming, as "the first platinum discovered in this country." Platinum was long since discovered in this State, it being a not uncommon placer product. It has also been found in Oregon.

THE Yreka *Journal* says the miners at Cherry creek are prepared for ground sluicing as soon as the snow melts. They expect a good opportunity of day supply until late in the summer, by means of the self shooters, an automatic device for opening the taps when reservoirs are full.

AUSTIN & Co. of the blue gravel mine on Greenhorn creek, near Yreka, continue to take out from seven to nine ounces a day, and will do much better when the weather gets warmer, or warm rains occur to furnish sufficient water to wash the tailings. The total cleanup for last week amounted to $1300.

LAST Monday, while a cage was being lowered in the Crown Point mine, at Virginia City, Nev., the breaking of cogs in the pinion wheel of the hoist engine caused the wreckage of the entire hoisting plant, the cage and the cable dropping to the sump on the 1100-foot level. No one was hurt. The damage was between $2000 and $3000.

THE usual order of things is reported reversed at the Sunny South mine, Placer Co., where the white miners accepted a recent cut in wages from $3 to $2.50 per day, while the Chinese, who were cut from $1.75 to $1.50 laid down their tools and refused to work at the reduced wages. Supt. Power is putting on white men in their places.

COMPARING results of operations at the Silver King and the Number One, Ainsworth camp, the *Tribune* points out that, with the expenditure of labor equal to 14,600 ten-hour days, the Silver King shipped 700 tons. From the Number One, with 1200 ten-hour days' work, an equal amount has been shipped. The Silver King had a superintendent from West Africa. The Number One is managed by a Mr. McVicar.

THE Jones & Ready mine, adjoining the De Lamar (Idaho) mine on the north, was sold this week to the McKinley Bros., of Wisconsin, for $80,000. The purchase includes the Jones quartz mill and site located below the De Lamar mill on Jordan creek. The new owners will put thirty men at work opening up the mine and getting the mill in shape to work the ore.

THE report of John Hays Hammond on the gold fields of Mashonaland and Matabeleland is to hand. It is comprehensive, and, though conservative, inclines to be favorable. The conclusion is that wealthy corporations would do well, but that individuals would not prosper. Everything is cheap but transportation, and railroads now heading for that region will soon make that cheap, too.

THE placer ground of eastern Oregon covers the greater portion of Baker, Grant, Union and a part of Malheur and Umatilla counties. The same districts are also seamed with veins of gold-bearing rock of greater or less value, but a large number of them are sufficiently rich as to be profitably worked. Regular deposits are made weekly from some of the mines, and it is an unusual thing to find the Baker City bank without several large gold bricks on its counters.

OF a published total of 331 mining companies representing a capital of $103,000,000, sixty-eight were controlled in Great Britain last year. Eighteen companies, representing £1,221,500 were registered for operations in Europe: 10 in Asia, having £932,007 capital; 79 in Africa, with £6,230,780 capital; 25 in North America, with £1,685,700 capital; 18 in South America, with £2,269,220 capital; and 113 in Australia, representing £7,439,014 capital, the latter country claiming over one-third of the total British capital so represented.

THE Lemhi Gold Mining Company, with a capital stock of $5,000,000, divided into 500,000 shares of the par value of $10 each, has filed articles of incorporation in Salt Lake. The board of directors under oath—a formality exacted by law—testified that they believed the Grand Central, Annex, Shylock, Lemhi, Silver Queen, Gold Creek, Crown Point, Gold Bed, Away Up, Gold Bug and other claims in Lemhi county, Idaho, upon which the capitalization is based, were worth now and prospectively that much. The officers of the company are ex-Congressman G. W. E. Dorsey of Nebraska, president; D. D. Johnson, vice-president; L. A. Benton, secretary and treasurer. These, with S. J. Weigel, T. P. DeGroat, W. H. Goss and Truman Schenck, constitute the board of directors.

A MEMBER of the London Stock Exchange writes to the New York *Financial Record* as follows: "The space formerly devoted to the American market is deserted, but we are better off than the brokers of the New York Stock Exchange. We have a new pack of cards to play with—South African properties. At this moment the game is lively and, so far, profitable to brokers and customers. Can you not give us a new pack of Americans? The old one is worn out."

THE Pilot Bay, B. C., smelter burns thirty cords of wood a day, and soon expects to use eighty cords when the charcoal kilns are in operation. Six months ago the partially completed smelter buildings at Pilot Bay were surrounded by the wreckage of the high water of last June. A 200-ton concentrator is in operation, four roasters have been built and two of them put in use, an 80-ton stack is almost ready to be blown in, machinery is being placed in position for sampling works, and every barge on Kootenay lake is being used to transport either ore or fuel.

THE following are recent incorporations: The Lake View Consolidated Gold & Silver Mining Co., at Dillon, Montana, capital stock, $500,000. Slocan Surprise Co., of Chicago, Ill., at Victoria, B. C.: capital stock, $225,000, with shares at $100 each. Bellingham Bay Hydraulic Mining Co., at Fairhaven, Wash., registered at Victoria, B. C.: capital stock, $30,000, with shares at $50 each. Yahk River Placer Mining & Development Co., at Phillipsburg, Montana; capital stock, $800,000. Incorporators, John Ainslie, Chas. Glass, Dr. I. W. Power, T. T. Grant, Vernon Curtis.

IT was recently claimed in the San Francisco *Chronicle* and Colfax *Sentinel* that Fred Howell of the Hidden Treasure mine, in Placer Co., was and is the oldest miner in the State, he having mined right along for sixty years. A brief but interesting biography was given of the aged gentleman who has spent sixty years in the active work of mining. But there are fifty-six other counties to hear from; and calling the roll—Alpine, Alameda—we come to Butte, which comes up with a miner named Joseph Glines, who has been mining sixty-one years. He is at present developing the Willard mine near Magalia. Mr. G. was born in Marietta, Ohio, July 19, 1815. In 1834 he went West in company with his father to the lead mining district in northwestern Illinois, Jo Davies county, and commenced his mining career near the town of Galena. After spending a few years there he went to a mining section in what was then Michigan territory, but is now the southwestern corner of Wisconsin, where he continued mining till the spring of 1850, making sixteen years. On the 23d of May of the last-mentioned year he left the town of Shullsburg, Lafayette county, with the pack train of Capt. Al. Townsend, who struck the gold mines at Rough and Ready, Nevada county, in 1849, returned to the States and crossed the plains again in 1850. This company reached Grass Valley, in Nevada county, then a mining camp of three houses, on the 9th of September—Admission Day. He spent twenty years at mining in Nevada county and twenty-five to date in Butte, making sixty-one years in all. He lived a widower thirty-eight years, but last fall married again. If there be any older miner than he in the State, it is not noised around much.

Personal.

STATE MINERALOGIST CRAWFORD has returned from a trip to Placer county.

C. M. KENNEY has been elected general manager of the Pacific Rolling Mills.

H. W. CLINTON, a brother-in-law of Adolph Sutro, is to have the superintendency of the Sutro tunnel.

JOHN A. KIRBY, a practical miner, has been given the superintendency of the Bullion-Beck, Utah, mill and mine.

F. B. PLEBY, a mining expert, is visiting Methlahtkatla and other Alaskan points in the interest of Senator Jno. P. Jones.

DR. G. M. DAWSON, C. M. G., F. R. S., has been appointed Director of the Geological Survey of Canada, in succession to Dr. A. R. C. Selwyn, who has been superannuated.

IT is the paper that is most carefully read that gives the advertiser the best returns for the money expended. There is probably no paper in the country that is more closely read by its intelligent subscribers than this one, and in every mining community in the west half of America thousands of readers weekly note every line in its columns before filing it away for future reference. Since the recent revival in gold mining in this and other States, the already large number of readers has greatly increased, and the increasing number of inquiries daily received regarding matters, new and otherwise, discussed therein, evinces the interest felt throughout the mining world in the MINING AND SCIENTIFIC PRESS—the oldest of its class in the nation.

THE singular discrepancies in bids for work, so often noted, appear in electrical as in other lines. Recently the Interior Department at Washington, D. C., called for bids for the construction of a telephone system. A Philadelphia company bid $2,996; its instruments made an average of 97½ per cent in the test. There were six bids. A Chicago company, whose instruments made an average of 95 per cent, got the contract, its bid being the highest—$5,565.76, nearly twice that of the Philadelphia company.

The Great East Lode of California.

Written for the MINING AND SCIENTIFIC PRESS by W. H. STORMS.

All are familiar with the term "mother lode" in Californiа. It is generally understood to comprise all of those mines extendiug from the vicinity of the old town of Bridgeport, in Mariposa county, in a direction somewhat west of north entirely through Mariposa, Tuolumne, Calaveras and Amador couuties, and extending into El Dorado. The principal points along this great mineral zone are the Pine Tree and Josephine mines, uear Bear Valley, Coulterville, Jacksonville, Jamestown, Robinson's Ferry, Carson Hill, Angels, Sau Andreas, Jackson, Sutter Creek, Amador City and Plymouth. These points are directly on the line of the so-called "mother lode," and will serve to assist in fixing the geographical location of other mines to be referred to.

The "mother lode" has a remarkably straight course, as a glance at the State map will prove. Lying to the eastward of the "mother lode," at distances varying from five to fifteeu or more miles, is another gold belt second only to the more famous "mother lode" in importance. The course of this east lode is also remarkably straight. Its mines are disconnected, it is true, and therc is no great dike of ankerite to distinguish it throngh county after county, yet there is a persisteuce in the manner of the occurrence of shoot after shoot in rocks of distinctly different character.

Iu Mariposa couuty the east lode is about fifteen miles east of the "mother lode." Opposite Coulterville it is twelve to thirteen miles distaut. At a point east of Jamestown the distance is about ten miles. When opposite Angels the east lode is eight miles from the center of the "mother lode," the mineral belt of the latter beiug here three miles wide. Iu Amador county the east lode is but six miles distaut from Jackson.

Thus it will be seen that the east lode has a more westerly trend thau the "mother lode," and apparently would intersect it. Before this convergence occurs, however, the country is so much disturbed in El Dorado as to reuder it impossible at present to say whether these two great vein systems converge or not. They are not known to, at any rate.

The mines of the east lode do not occupy a single great fissure, but along a certain line of disturbance we find many fissures, all of which have a decided branching teudency. The great veins send out many spurs, chiefly into the hanging-wall, though they often occur in the footwall. Great movement, which has resulted in well-marked striations, are common and prominent features of this belt. The chief and most striking characteristics of this vein system are their branching habit; the overlapping of the walls; the deep striation of the planes of the fissures, the grooves being sometimes mere scratches, at others a foot wide; and again they occur in great swells six or eight feet across; the crushed and broken condition of the rocks adjacent to the walls; the frequent mixture of quartz and wall rock in the pay shoots; the occnrrence of massive qnartz free from these slaty inclusions and usually very low grade iu gold; and the universal presence of eruptive dike rocks with the fissures often in direct contact with pay shoots.

The general direction of the lode, as has been stated, is northwest, bnt the mines strike at all conceivable angles from east around to west, though most of them strike in a northwesterly direction. It should be noted also that these mines nsually conform with the *strike* of the enclosing slates, though not with the *dip*. The quartz from those mines which conform to the strike of the enclosing rocks (the slates) always coutains more or less slaty material and bears a marked similarity, but that from those fissures which cross the strike of the slates is usually more massive and easily distinguished from the former, and contains less of the slaty wall rock. This condition is also noticeable iu the veins of the "mother lode."

Where there has been great movemeut since the formation of the vein, the tremendous pressure resulting in crushing and granulating the qnartz, the rock from one mine can scarcely be distingnished from another. A brecciated condition is often fonnd in these veins.

The direction of the pay shoots may always be inferred from the striations on the wall. They almost invariably pitch in the direction indicated by the grooves.

Nearly all of those veins which strike north, and from there around to the east, are more massive thau those striking west of north. This is due, as has already been indicated, to the fact that the general trend of the formation is west of north. From a geological standpoint I consider the entire fissure system as one great lode, dne to a common orographic movement of the western base of the Sierra Nevada.

The fissures cut everything in their course—granites, slates, schists, diorite and diabase—and also, usually, the later acid eruptive rocks, which always accompany these veins. These light-colored dike rocks which cut through the older diorites and diabases, are found in the bottoms of the deepest canyons aud on the summits of the highest hills. They are all of the granitic type and range from a granite of very coarse crystallization (pegmatite), as in the North Fork mine in Tuolumne county, or at the Dead Horse mine near Summersville, to grannlite in the Bandarita, east of Coulterville, and felsite at Hite's mine and in the Keltz, north of Sonlsbyville.

The geological indications all point to the fact that these acid eruptives were first injected into the planes of weakness caused by a stress and movement of the mountaiu masses, aud that the formation of the veins was altogether subsequent to this period.

A continued movement of the rocks on the fractured planes formed the couditions so essential for the infiltration of mineral waters bearing the silica, gold and several sulphide minerals. These movements were doubtless continued from time to time during the formation of the veins, and in mauy places long after their formation was complete, unless, indeed, as some suppose, they are still forming. Perhaps they are. I am not prepared to dispute it, though I doubt such being the case at any point above the drainage level, by which I mean that level where snbterranean waters pass upward from pressure and not downward by gravity.

The masses of quartz present several phases of formation. The frequent occurrence of a banded structure (ribbou rock) suggests that the rim was formed largely by the infiltration of mineral solutions into a mass of foliated, crushed slate. In some cases this banded appearance may be due to the original structure of the slaty material, and in others to numerous parallel fissures occnrring side by side, bnt in the majority of instances it seems to have been occasioned simply by the slaty or schistose structure of the rocks forming the walls, this structure being still preserved.

Those portions of the lode occurring entirely withiu grauite are usnally more massive than elsewhere, though a banded structnre is also sometimes noticed in these mines. But I apprehend that in such cases the structure is due almost entirely to movement and pressnre.

There are occurrences of crystallized quartz in some of these mines, indicating that the vein was deposited in au opeu crevice. These cases are not common, however, on this lode.

The great masses of white quartz sometimes found containing no slaty or other inclusions, I am at a loss to understand, unless it be that the mineral solutions concentrating at these points from some unknown cause, resulted in a complete dissolution of the fractnred country rock and its entire replacement by silica. In other regions I have seen masses of snow-white quartz so large and free from all other material as to lead me to believe that they may possibly be of eruptive origin, altered somewhat—subsequently, no doubt.

The dike rocks, already referred to, occur in connection with every mine along the lode. By inquiry and investigation it was learned that almost invariably the near presence to or direct contact with a dike resulted in an enrichment of the ore. I cannot doubt that these dikes have had a beneficial effect on ore deposition. Just what the nature of this influence has been, it appears difficult to determine. This question has already been the subject of much disenssion, and well-known authorities are, as yet, far from an agreement. Many believe that the minerals of veins and ore deposits are derived directly from neighboring eruptive rocks; others contend that these dikes are simply channels along which mineral waters have found a passage, aud that the solutions have deposited their contents in the places best prepared for their reception. It is a well-known fact that valuable ore deposits do occur where there are no dikes, as in the Missouri lead and zinc mines; but there are fissures, evidently having great depth, through which the mineral solntions asceuded.

We know of profound faults which must extend to very great depths, aud yet no ore deposits occur aloug the plane of fracture. Still, this would not disprove the hypothesis that mineral solutions came up from great depths aloug chaunels afforded by the fissure planes of an eruptive dike. There can be no doubt of the deep-seated origin of the dike rock, while there is doubt as to the depth to which the most profound faults may extend.

The influence of dike rocks upon ore shoots and pockets shonld be more carefully studied by miners themselves, as a more complete knowledge of the relation of ore bodies to the adjacent rocks may lead to many important results. By comparison I find that many of the most valnable mines of the past and present in this State are accompanied by dike rocks of marked similarity, not only on the east lode, but elsewhere.

The principal mines on the east lode are the Hite, Ferguson, Comet, Kanaka, Bandarita, Hasloe and Red Clond, in Mariposa county; the Bnchanan, Consuella, Huuter, Dead Horse, Eureka, Louisiana, Puerto Fino, Laura, North Star, Soulsby, Black Oak and Keltz, iu Tuolumne county; the mines of the Americau camp, Collierville, Sheep Ranche, Railroad Flat and West Point district, in Calaveras county; and those at Weiland, Pine Grove and the belt east of Volcono, in Amador couuty.

The total production of these mines I do not know, but it is a large amount, considerably exceeding $10,000,000.

The mines in the vicinity of Murphys, in Tuolumne county, are not properly on this belt, but are situated between the "mother lode" and the east lode. The Confidence mine and those near it, in Tuolumne county, lie east of the east lode; and there are many others in this eastern belt, lying between the east lode and the Sierras, of which little is known. Attention is being directed to that region, and these prospects, so long idle, are likely to take a prominent place in the active mines of the State.

There is now considerable activity all along the east lode, and this is destined to continne with encouraging and substantial resnlts.

The Comet mine in Devil's gulch, in Mariposa county, is a new enterprise on this lode. Several old mines are being reopened near Summersville, and also in the vicinity of Volcano.

On the Choice of a Career.

The profession of a mechanical engineer, to the uniuitiated, holds forth big inducements, and the young man who starts in college works his way along, graduates and nine cases in ten is assigned a positiou over the drawing board. Draughting, in its higher forms, is one of the most interesting subjects in existence, especially when other conditions are such as to promote the interest. It rests in the hands of the draughtsman whether the machine will be pulled down several times in order to correct mistakes, and in many cases whether the machine goes to the "scrap heap" or is shipped away a success.

One of the first couditions of good work is a comfortable place to work in. How many concerns in the country, manufacturing machinery, have even a decent place for their draughtsmen? The average is a dirty, badly ventilated, dimly lighted room without proper heat in the winter, frightfully hot in the summer; yet educated men are supposed to go there, use their brains, avoid mistakes, and rush through their work, turning out machine after machine, having a highly heated gas jet within two inches of the top of their heads; yet, invariably, if a man be taken ill—may be from standing in a draught strong enough to blow a tracing off a table—he is "docked" for the time he is away. It would be interesting to obtain a list of the firms that give their men a holiday without taking a day's pay from their already magnificent remuneration.

The draughting profession at present is a delusion and a snare, as regards the general machinery business, and the old plea that a man is "learning something" is no excuse for a firm paying its head draughtsman $18 per week. A man can keep on "learning something" until he is ready to die of old age, living on small pay. So many people say, "It is so hard to find a good draughtsman." Why, most men who arrive at the age of thirty either get away from the board or out of the business, driven to desperation by the "learning something" basis of pay. Suppose, through nothing but competency, he secures a very remunerative position. Invariably he is obliged to isolate himself from civilization in some small country village, or in some swamp, where many concerns locate their works; and once there, he stands a good chance of staying there unless he is "fired." Some companies, heaven bless them, realize that draughtsmen are human beings, and a roll of honor should be framed for them. There shonld also be a list of firms that should be avoided by any man who has any regard for fair treatment and health. Long hours, rushing, driving work, contemptible pay and hopeless prospects take away all interest in the profession, which is certainly on the decline.—"Condensation" in Scientific American.

Automatic Water Tanks.

Dnring the past year, says the *Railway Age*, the railways of the United States paid $7,000,000 to maintain the 10,000 water stations in this country. This expense, it is claimed, will be saved by the automatic tank now coming into use. This tank is actuated by steam from each locomotive as it stops for water—steam that would otherwise be wasted, as almost every locomotive while taking water blows off steam representing more than sufficient power to elevate a tenderful of water. There is nothing to do in operating the tank but for the fireman to turn on steam, which starts the flow of water into the tender, and to shut it off when the tender is filled. The next locomotive may be brought to the tank at once, a full supply of water being always ready.

THE *American Shipbuilder* says the large shipbuilders, Harland & Wolff, Belfast, Ireland, who built the Majestic and Teutonic, pay riveters $7.54 per week; patteru makers, $8.27 per week; platers the same; and fitters $6.57 to $8. More than twice these sums are paid in this country to the same trades, and it is no wonder that merchant ships are built abroad instead of this country, with snch a wide discrepancy in the cost for labor.

The Lick Statuary.

One of the newest and most notable of the city's attractions is the Lick Statuary in front of the City Hall. It is the result of a provision in the will of James Lick by which $100,000 has been expended to commemorate notable features of the history of California. Of twenty-eight competing designs, that of Frank Happersberger was chosen, and the engraving shows its form and characters.

The monument consists of one central, spherical structure of Rocklin granite, 47 feet in height from the ground to the tip of the spear of the bronze figure on top. This center structure is approached by a flight of steps, and wing-like pedestals extend from the main structure on four sides. The main figure, and the one that first attracts the eye, is a bronze figure of Eureka, 12 feet 6 inches high and weighing 8000 pounds. The four side pedestals each uphold bronze figures of heroic size. Upon and around the center structure are bronze alto-reliefs, typifying California productions, and portraits and names of men who have made California history. The four lower pedestals each support elaborate bronze designs representing mining, commerce and agriculture.

The south group, and the most prominent, in many ways, represents the miner, the characteristics of which are well portrayed in the illustration. The discoverer of sundry gold nuggets is showing them and where he got them from to his two companions, who seem imbued with the realization of what that gold discovery meant to California and the world. The statuary constitutes one of the sights of the city.

THE LICK STATUARY RECENTLY COMPLETED IN SAN FRANCISCO.

Times Have Changed.

But a few years ago, says the Cosmopolis, Wash., *Enterprise*, all that was necessary to coin money in the manufacture of lumber in western Washington was to place a mill almost anywhere, get a crew of loggers and mill men, and begin operations. There was no necessity of hunting a market for the product, as customers were anxious and waiting.

But times have changed. The home market has ceased to be much of a factor, and the strong competition has reduced prices so that only the mills that are favorably located and equipped with the latest improved machinery are in the race. A good location is absolutely necessary, if success is desired; and such a location must include a convenient and abundant supply of suitable logs, and ample facilities for shipping both by water and rail.

Eastern buyers of Washington lumber demand the best grades, either of large dimensions for bridge building or of the smaller dimensions. It is impossible to pay the freight on common lumber and sell it in the Eastern market. The price the consumer would have to pay would be out of proportion to that asked for common lumber brought from other places, and there would be no sale for common lumber from Washington.

Every mill when running turns out a certain percentage of low-grade lumber, for which a market must be found. With the local demand limited and the East most effectually barred, recourse must be had to a market opened to the lumbermen of this State by the use of deep-water vessels. In putting up a new mill, then, or moving a plant that has been in use, the promoters of the business enterprise would select for a location none other than a seaport town. They want a point as near their common-lumber market as possible, a point where the best harbor and docks can be had, a point where all the logs needed can be obtained easily and safely held until wanted for use, a point connected with the great railway systems of this country.

As an indication of how the slave trade survives in Africa, it is stated that last summer a caravan of 10,000 camels and 4000 slaves left Timbuctoo for Morocco.

Diamonds.

The El Dorado *Republican* of recent dates has two accounts of the finding of diamonds in that vicinity. The more recent is as follows, clipped from that paper of issues Dec. 6 and 20, '94:

FOUND A DIAMOND.

Bert Carpender, son of Justice W. F. Carpender of this city, while panning some tailings from the deep gravel channels at Smith's Flat one day last week, found a very handsome and perfectly formed diamond, though not a very large gem. He picked it out of his mining pan after washing its contents nearly out. The stone weighs nearly two carats, and is about the size of an ordinary pea. The exact value of diamonds depends very much on the fancy of the purchaser, but this one is probably worth anywhere from $50 to $150, and Mr. Carpender does not appear to be anxious to sell it for $100, as he thinks of having it set in a ring. A number of other diamonds have been found in the same vicinity, the most valuable specimen being sold for $300, although it is now believed that it was worth five times that price.

ANOTHER DIAMOND.

We recently announced that Bert Carpender had found a diamond at Smith's Flat while working some tailings from the ancient river channels passing under this place. This week he found another in the same place. The first weighed nearly two carats, and the last more than one and a half carats. His unusual good fortune has attracted considerable attention, and may lead to further discoveries, as so many diamonds have been found in this locality that it seems probable that they are more numerous than has been supposed. Hundreds of them have been probably crushed in the gravel mills, as fragments have been detected in the tailings. It seems probable that the origin of these diamonds is in the lava which caps all the ancient river channels in this part of California, for, except in color, it appears similar to the volcanic cement in which they are imbedded in South Africa.

This is not the first time that attention has been directed to the fact that diamonds are a California product, though a rare one. It may be that some prospector may strike a diamond mine. Inquiries are occasionally made by placer miners and diamond prospectors, for some simple way by which, without the possibility of mistake, they can tell when they find diamonds in the working of their placers. The books on the subject of precious stones do not give plain directions for that purpose. One often hears of stones, supposed to be diamonds, being sent to London, Paris and other places for determination, denoting that there is much attention being paid to this matter. Melville Attwood, F. G. S., has been in the diamond mines of Brazil, and says:

"I think that the gold and diamond placers of Brazil, like those of California, may properly be divided into three classes:

"1st. The surface washings and the ravine diggings, which have derived their gold principally from the degradation or breaking up by atmospheric and aqueous agencies of the croppings of the auriferous veins. The gold found in these placers is mostly angular, with pieces of quartz adhering to it. This class, to a certain extent, has been the most important of the three, as nearly all our richest quartz veins were discovered by working them. For instance, in the Grass Valley district, at Rhode Island Ravine diggings, the first gold vein was uncovered—the Gold Hill. Then the Boston Ravine diggings, the Massachusetts Hill mines, the Allison Ranch diggings, the Allison Ranch mine, the Lamarque diggings, near the north branch of Wolf creek, which uncovered the Eureka, Idaho, etc.

"2d class consists of the recent river beds, from which the water has been diverted, and the present river beds. In this class most of the Brazilian diamonds are met with.

"3d class, the ancient river beds, in which diamonds are also found.

"The Brazilian miners distinguish the various diamond placers by the following names: Grupiara, an alluvial deposit whose surface shows it to be the unused bed of a stream or river; burgalhao, small fragments of rock bestrewing the surface of the ground; easealho, fragments and pebbles of quartz, or rock and sand mixed with clay, forming the bed of a river; takoa carza, which consists of the above materials cemented together, forms a conglomerate mass. All, however, are known by the generic name of 'Cascalho.'

"The diamond prospector's outfit should consist of a light pick, a shovel, and two riddles, one having three-fourths of an inch apertures and eighteen inches in diameter, the other having eight holes to the linear inch; a miner's wallet, which is a bag four feet eight inches long by eighteen inches wide, with an opening in the middle—it can be carried over the shoulder or used as a saddle-bag, and in it a miner can pack forty pounds or more of gravel for a long distance; a tub for washing the gravel in—this may be got by cutting a wine or beer barrel in two (a rubber bath-tub will also answer the purpose); a piece of rubber cloth, to be used for sorting the gravel on; a watchmaker's lens of two powers, fitted into a spectacle frame; and a placer miner's scale of hardness, consisting of fragments of diamonds, sapphires and quartz, mounted at the ends of pencils. This outfit, with the scale of hardness, can be obtained of John Taylor & Co., San Francisco. The scale of hardness can be easily made by taking the rubber from the end of a pencil and filling the space with lapidary's cement, which melts at a very low temperature. Warm the fragments of diamonds or sapphires over a small spirit-lamp, and, while hot, insert them in the cement. By wetting the fingers and rubbing the cement, it can be molded into any shape desired, and, when cold, it will be as firm as if soldered.

"The sample of gravel to be examined must be first put into the coarse riddle and that fastened above the finer one. Then immerse both riddles in a tub of water, and, with a half-rotary motion, wash all the fine gravel into the lower one, the dirt and sand passing through into the tub. Then throw away what was collected in the coarse riddle, unfasten it from the finer one, immerse the latter in the tub of water, and use a jigging motion till all the heavier portions of the gravel have settled at the bottom. Continue the jigging, and by raising the riddle a little at one side you can get all the gravel to the opposite one. Then, with a very quick motion, turn the contents onto the sorting cloth or board, which should be placed near the tub. The heaviest gravel will then be at the top, and can easily be examined and tested. Take the pencil with the fragment of diamond mounted at the end of it, and, pressing lightly, try to scratch the suspected stone, at the same time looking at it through the lens. If no mark or scratch is found upon it, it must be a diamond, no matter what the *shape* or *color*.

"The fragments of diamond may be protected from injury by the metal covering used to cover the sharpened end of pencils. In Brazil, as yet, no mines have been discovered like those in South Africa, such as Kimberly, De Beer's, Du Tort's Pan, and Bultfontein, where the diamonds may be said to be found *in place*."

E. I. Dunn, in a paper read before the London Geographical Society on the African diamond mines, says: "That the old mines are 'volcanic pipes,' and that they have burst through these carbonaceous shales, is evident. Is it not reasonable to infer that the carbon, indispensable in one form or another to the formation of the diamond, was supplied by these shales?"

The chances are good that we may yet find in California one of these "volcanic pipes."

John G. Brady, of Alaska, proposes to explore Mount Edgecombe with a diamond expert and search for diamonds, which are thought to exist there.

Late last fall a hunter and prospector brought in some brilliant-looking lava ashes to Sitka, and showed them to Mr. Brady. The latter sent them to an expert in San Francisco, who returned word that an investigation should be made at the earliest opportunity. The contents of that letter contained astonnding information—pumice stone and scoria had all the elements for the presence of diamonds. Mr. Brady has perfected plans to reach the extinct crater of Mount Edgecombe, as soon as the snow and weather will permit.

For many years mineralogists have scrutinized the sides of Mount Edgecombe with a professional curiosity, because the lava scoria, ashes and pumice stone lead these men to conjecture that perhaps the conditions are favorable for the lodgment of the treasures for which Kimberly, South Africa, is known the world over.

The diamond is one of the things that the public is never tired hearing about, and is ever anxious to see, discuss, and, above all, to possess; but few have any idea of the tedious and laborious process by which the precious gem is mined and brought to the light of day. At the Kimberly mines all the entrances are rigidly guarded, and only the written permit of the manager will enable the visitor to descend the huge shaft which pierces the working level, say 1000 feet below. In the tunnels of the mine, which are about seven feet high, the miners are hard at work drilling holes in the adamant ground with a large crowbar, which they use with both hands. After making six holes each, which may take three hours, or six, or longer, according to the hardness of the stratum they are working in, they are allowed to retire to their homes in the compound and rest for the remainder of the day. Dynamite cartridges are placed in the drilled holes and exploded, and the blue ground which has been dislodged is shoveled into trucks, each of which holds a ton, run along the level and taken up the shaft. It is taken in large lumps as hard as granite to "the floors," where it is spread out and left from three to six months to be pulverized by the action of the sun, air and rain, a steam harrow being run over it from time to time to assist the process of disintegration.

In due time it is taken to the washing machine, the work of which is to sift out all the light deposit, called "tailings," in which no diamonds are found, and to clean the "ground," which is then placed in a hopper and carried by revolving buckets to the top of an elevator, whence it is dropped into a cylindrical pan. As the pan is rotated water is thrown on its contents, and the mass is chipped and sliced by iron knives, the light mud overflowing in the center, and the heavy deposits containing the diamonds passing into a pulsating receiver, from which it is graded into three different sized sieves. Water is then pumped through the bottom and the light deposit is forced over the top, the heavier substance falling through the sieves. It is then passed by means of valves into tubs, and the important work of searching for the diamond commences. Four times do the searchers examine every particle of the material, and so carefully and thoroughly is their work done that it is said that a half-carat diamond might be mixed with a couple of hundred-weight of earth in the hopper at the upper end of the sifting machine, with perfect assurance that it would ultimately come into the hands of the sorters.

Such vast quantities of gems are consumed in this country that the United States Geological Survey has thought it worth while to prepare a monograph on the subject, which will soon be issued.

The fact has been established that the supposed diamonds found in meteorites near the canyon Diablo in Arizona are actually such. This is a matter of profound interest, indicating as it does that such stones exist on other planets. Some authorities assert that diamonds, like coal, which is so nearly of the same chemical composition, could not possibly come into existence without previous vegetable growths to generate their material. For this reason they infer that the finding of the gems in the meteorites proves that there must have been vegetable life in the place whence the meteorites came. If there was vegetable life there is a fair presumption that there was animal life also. All this may be untrue, but it affords the first guess glimpse ever obtained into the greatest problem that mankind has attempted to handle, namely, the question whether life exists in other worlds than ours.

It seems strange to take a couple of ounces of charcoal in one's hand and to consider that one is handling the pure material of the diamond. If one could transform into crystalline form, he could sell these few pinches of stuff for $1000 perhaps. No wonder that chemists are eager to discover the secret of effecting this change. To assert that they will never learn how to make crystals of carbon would be absurd. By means of the voltaic battery real diamonds of almost microscopic size have been deposited upon threads of platinum. But, even if a successful process should be discovered, it might be that the cost of making a diamond by it would be bigger than the price of a stone of equal size and purity from the mines. One recalls the experiments of Professor Sage, who turned out gold pieces in his laboratory from gold extracted from the ashes of certain buried vegetable substances. The result was beautiful, scientifically speaking, but the expense of making in this way one $5 piece was about $25.

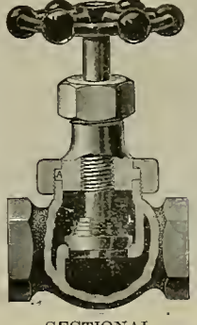
The value of rough gems of all sorts produced in this country in 1894 was $47,000 less than the output for the year before, amounting to only $237,000. The decrease was mainly owing to the industrial depression. The precious stones of the United States are sold in large part to tourists, who purchase them as souvenirs of localities visited.

Under date of the 1st inst., writing from Cripple Creek, Col., Mr. Alfred H. Hale, regarding a recent article entitled "African Diamond Mines" and the "Law of the Dutch Republic," calls attention to the fact that the Kimberly mines are situated in Cape Colony and are governed by the laws of that country. One can readily see how strange it would look were a person who has spent some time in traveling through the United States to locate Denver, Col., in California.

Some of the South African diamond mines are situated in the Orange Free State, but they only produce about seven per cent of the diamonds of the country.

Lunkenheimer's Regrinding Valves.

We present herewith a view of Lunkenheimer's regrinding globe valve, which possesses some features of special merit. Instead of the hub being threaded direct to the body of the valve it is merely fitted into it plain, and rests upon a flange which fits upon the upper edge of the opening, as shown in annexed cut. The hub is then secured by a nut which fits over the flange, and is threaded to the outside of the body of the valve. The result of this arrangement is that the valve can be reground at any time with the greatest facility, because all that is necessary is to loosen the nut, remove the hub, place a little sand and soap under the disk, and replace the hub, leaving the nut loose so the hub is free to turn with the stem during the re-grinding.



SECTIONAL.

A piece of wire or nail is passed through a hole provided for that purpose in the lower end of the stem of the disk, so that the disk will turn with the stem during the regrinding, which of course it does not necessarily do when the stem is in use.

The hub, being in place when the grinding is done, effectually centers the stem and holds it in proper place, so that the regrinding is done correctly. The valve can thus be readily ground while in position, and in many cases this does away with the necessity for breaking connections. The disk is also, of course, easily replaced when required. These valves (on account of having an outside thread and union connection for holding the hub to the valve shell) are always easily taken apart, as the hub will not

"cement" into the shell, as is the case with all other makes.

These valves are made of gun metal throughout, tested and inspected before leaving the works, and, as a proof of their superiority, are extensively used in rolling mills, refineries, on locomotives, steamships, and in the United States navy on cruisers, where the requirements are very severe. They are made by the Lunkenheimer Company, Cincinnati, O., who will be pleased to hear from any members of the trade. They have catalogues on brass goods for steam, which they will send to any address.

Dredging at Dayton.

(Continued from page 97.)

of Mr. J. C. Pierson of Sacramento as manager, and Captain Herman Davis, a marine engineer of note, to the position of superintendent, at Dayton.

Early in May, 1894, construction of the new plant was commenced from plans designed and drawn by Manager Pierson and Captain Davis, and all work was done under the immediate supervision and inspection of Captain Davis. Most parts of the machinery are original in design and were perfected for this particular proposition. The labor-saving devices are many and ingenious, and the writer found upon recent inspection that everything had been constructed in a very substantial manner. The plant consists of a large and powerful clam shell dredger, with a two-yard bucket, capable of easily handling from 1500 to 4000 tons per day of the river material. The amount varies with the conditions of the river bed and the proportion of rock, gravel and sand to be handled. The dredger is run by steam and has engines amounting to 150 H. P.

The second part of the floating plant consists of a barge 40x85 feet, on which is the machinery for screening the sand from rocks, gravel, etc. This barge also contains agitators, quicksilver traps, sluices and riffles for separating the amalgam, quicksilver and gold from the other materials. Power is furnished to the barge machinery by one double nozzle six-foot Pelton wheel of 80 H. P., working under 56 feet pressure, and one 4-foot double nozzle of the same make of 30 H. P. under the same pressure. Water for these wheels is conducted from the shore through a twenty-inch canvas hose attached to a conduit several miles in length which obtains supply from the river above.

The third part of the apparatus consists of the shore plant, a strongly built and double deck mill in which are a six-foot double nozzle Pelton wheel, a six-inch centrifugal pump, ten Woodbury concentrators on the lower deck, and twelve Warren concentrators on the upper deck; and above them, on a third deck, a distributor for the equal and even distribution of the pulp to the twenty-two machines.

The fourth part of the plant consists of the mill for working the sulphurets.

The general operation of the plant is as follows: The material is taken up from the river by the dredger, and dumped into the hopper on the end of the barge, where the large rocks, cobbles and gravel are separated from the finer sand by means of grizzlies. The finer material passes into revolving grizzlies that further separate the finer material from the coarser, and eventually it passes into a large revolving thirty-mesh screen, eight feet in diameter and eighteen feet long. All sand and pulp (which contains the sulphurets) fine enough to pass through this screen fall into a tank beneath, and pass into a centrifugal pump. The proportion of this pulp to the material hoisted from the river bed continually varies; sometimes seventy-five per cent of the material will pass through the final thirty-mesh screen, and at other times not more than ten per cent. The average is reported as about twenty-five per cent.

From the centrifugal pump the pulp is forced ashore through a pipe to a pump on the lower deck of the shore plant, by which it is elevated to the distributor on the third deck and from thence to the concentrators below. The barren sand, or tailings from the concentrators, are carried into the tail-race of the Pelton wheel that drives the shore plant, and by its current are carried away. The sulphurets are carried up and over the heads of the machines, and into their proper receptacles. The timbers of the shore plant are of 12x12 pine, and the whole is so constructed that as the work progresses up or down the river the shore plant may be moved in pace with the barge and dredger. Returning again to the barge; such material as enters the thirty-mesh screen and is too coarse to pass through its meshes is carried on and discharged at the tail end of the screen and the peculiar design of its helix. The material then travels onward and into a twelve-mesh screen, where it is again revolved and screened, or sized, and from there into agitators, thence through riffle sluices to the dump.

The distance through which the material travels and the process of continually extracting the barren sand and gravel affords conditions favorable for the recovery of quicksilver, amalgam and free material. This recovery begins the moment the material falls into the hopper from the dredger, and continues by various devices, including rillles. traps, sumps, amalgamating plates and settling pans, all so modified and distributed at various points as to suit them to the different conditions under which the free metal is presented for recovery.

In conversation with the writer Captain Davis said: "The working of this plant thus far has shown that each concentrator will handle from fifteen to twenty-four tons of this pulp each twenty-four hours, and the pulp or screened sand yields from three to forty per cent sulphurets. These sulphurets assay from $10 to $100 per ton. All of the factors are continually changing each minute of time that the machinery is running. For the short time in which the plant has been running since its completion, before the ice and cold weather stopped operations until warmer weather, the output was forty and one-half tons per twenty-four hours, averaging in assay value of sulphurets alone twelve hundred and sixteen dollars. The factors for free material, quicksilver and amalgam vary greatly. They vary from a few cents to several dollars per ton of the material hoisted from the river. The actual practical results can only be determined by longer practical work with the complete plant. Thus far the only actual known returns of quicksilver, free material and amalgam have been at the rate of twenty cents per ton for each ton of material hoisted from the river. In many places in the river the returns will go far above this figure, and at other places the returns for quicksilver, amalgam, etc., may go far below and amount to practically nothing."

The plant is at present closed down, on account of the cold weather, ice and snow, but the climate at Dayton will permit of at least 260 days' work during the year. Not including the men in the mills for working sulphurets, it requires eighteen men to run the plant day and night. These men are paid $2.50 per day for laborers, and $5 and $6 per day for experts in the different branches, the payroll amounting to some $2500 per month. Work will be resumed as soon as the weather permits.

If this be true of the Carson, why not equally true of the Sacramento and other rivers which receive the tailings of the various mines. A. C. ROBBINS.

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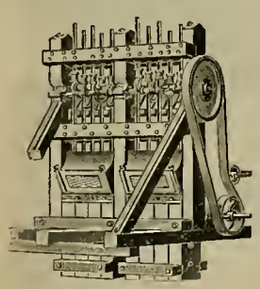

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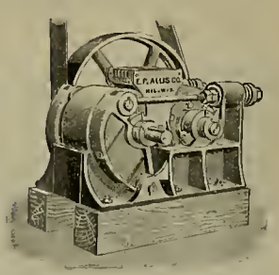

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Scientific Progress.

The Age of the Earth.

Scientists have differed greatly among themselves as to the probable length of time which the earth has taken to get into its present condition. Professor Guthrie Tait, having in view the rate at which the sun is supposed to be cooling, concludes that only about 10,000 years can be allowed to the earth since it was capable of retaining water on its surface in a liquid state. That, however, would presuppose a considerably longer period anterior to the other, when the globe was much hotter. Newcomb was disposed to fix the outside limit of the age of the whole solar system at 20,000,000. Clarence King computed, from experiments on volcanic rocks, that the whole duration of our globe had not exceeded 24,000,000. George Darwin figures out the interval that has elapsed since the molten mass composing the earth threw off the moon at 57,000,000. His calculations start with the influence of tidal friction in retarding the earth's rotation. Few estimates, however, have received quite the same respect from scientific men without a special theory of their own as Lord Kelvin's. Judgiug by the present temperature gradient in the earth's crust, as one goes downward, he thought that the whole mass could hardly have taken more than 100,000,000 years to eool down to its present stage.

Geologists, however, while not agreeing among themselves, have been disposed to demand still more time. Haughton made 200,000,000 his minimum; Sir Archibald Geikio's maximum is 680,000,000. In view of the very slow rate at which animal and vegetable species change, in the progress of evolution, biologists have favored the longer rather than the shorter periods here indicated; so that Lord Kelvin and some of his adherents have taken issue with those authorities as claiming altogether too much.

Such is this distinguished physicist's standing in the scientific world to-day that it has for years been considered rather audacious to question his conclusions on any point whatever. Nevertheless, within a few weeks, Professor John Perry, who occupies the chair of mechanical engineering and applied mathematics at Finsbury Technical College has made public his reasons for greatly extending our estimate of the earth's age. Like Kelvin, he assumes a sphere with a smooth surface, and a uniform heat of 7000 degrees Fahr. Taking it for granted, also, that the conductivity of the interior portion is the same as that of the crust, Perry gets the same answer as Kelvin, namely, about 100,000,000. But on the hypothesis that the internal mass had a higher rate of conductivity than the outer shell, this latest dissenter declares that a much longer time would be needed to bring the earth to its present state. On the basis of ten times greater conductivity within than without, Perry figures out a result fifty-six times as great as Kelvin's, while he regards it easily imaginable that 290 times as many years may have been necessary. Some excuse for supposing the inner materials of the globe to be the best conductors is found iu works of Dr. Robert Weber and Professor Joseph David Everett, well-known authorities on temperatures at various depths in the earth's crust. These experts are quoted by Perry to show that certain rocks greatly increase in conductivity with increase of temperature. This, with schists and micaceous gneiss, averages about 75 per cent for every 100 degrees centigrade; and at that rate Perry gets for an even earth perfectly solid at the start (to say nothing of a previous liquid or gaseous state), a result 1300 times as great as Kelvin.

At last accounts, the latter gentleman had agreed to look up Everett and Weber, and to consider the subject afresh.

ALVAN G. CLARK, speaking of "The Making of Large Lenses," makes special reference to one forty inches in diameter that he is finishing. The polishing is done by hand, and Mr. Clark is reported to have said that the heat of the "hand" so distorted the focus of the lens by expansion that it required three hours to cool it sufficiently for testing.

LORD RAYLEIGH and Prof. Ramsey claim to have discovered a new element in the atmosphere, an "inert gas," with its own boiling point, freezing point, critical temperature and critical pressure—all different from those of any other element. One of its properties is its invincible reluctance to combine with anything else. It will have nothing to do with oxygeu, chlorine, phosphorus, sodium, platinum or various other substances. Even the electric arc does not make it take companionship with anything. One important quality is a great puzzle. All the heat given to the new substance produces only the motiou of translation. In another respect argon presents difficulties. The great Russian chemist, Mendelejeff, has discovered an empirical law which associated the properties of the elements with their automatic weights. Now the new element has a density of thirty-nine or forty, which does not fit this law. "Argon," which is the name giveu the "new element," gives two spectra, the red and the blue, and it is this which raises doubt whether the investigators are dealing with one or two substanees. If the latter should prove true, then there is a new vista opened up, and it is suggested that perhaps one of the substanees will prove to be Professor Crooke's ideal protyle, the ultimate basis of matter from which all others are only combinations.

THE chemists of Americea, who have just held a general meeting in Boston, do not think chemical beefsteaks and other foods in sight for the human race just at prcsent, though chemistry has done much to develop the science of cookery, and given great variety to food and drink by the many essences of flowers and fruits that have been elaborated in the laboratory. The colleges of agriculture, and the agronomic experiment stations, of which there are now fifty-seven, have done so much to increase the productiveness of the the soil, and so reclaim unproductive lands, that Dr. Wiley, the retiring president of the Chemical Association, thinks that there is no economic reason for looking outside of scientific agriculture for the production of human food. On the other hand, Berthelot, an eminent European chemist, publicly proclaims his theory that artificial foods are in time to suppress those of nature; a time when the covering of the earth will be for beauty, as in a pleasure-park, and not "defaced by agriculture."

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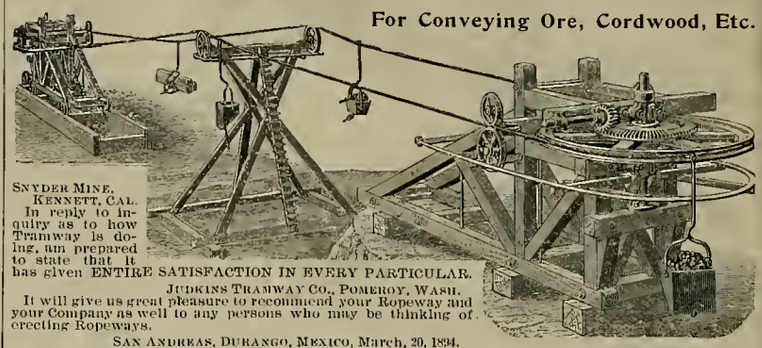

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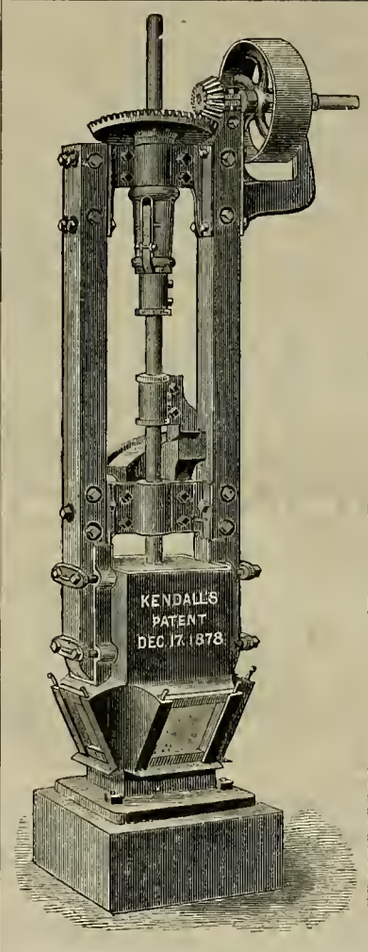

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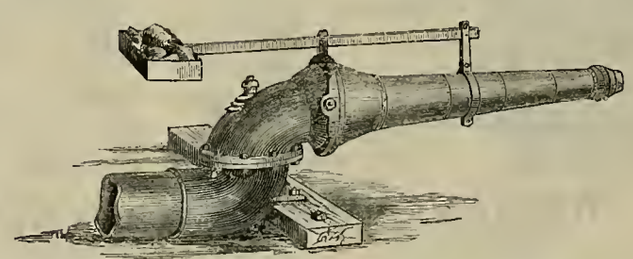

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Mechanical Progress.

Tesla's Steam Engine.

Much has appeared in technical journals concerning this engine, and considerable speculation has been indulged in regarding its practicability. The engine is a vibratory direct-generating one, or steam dynamo. The scheme is to produce electric current without rotary movement, friction or moving joints even, except of a steam piston, which directly vibrates or reciprocates—an armature between magnets. Mr. Tesla gives out the following particulars of his direct steam engine:

"I had gone considerably into the study of the practical aspects of the work which I was to present, and my notion was that I was touching upon something which would lay the foundations of a novel industry, perhaps of more than one industry. I dwelt chiefly on those features which possessed a purely scientific interest, my desire being to present the subject very modestly, as I was not quite sure of some of the questions involved. A prominent engineer came to me and said: 'Mr. Tesla, I want to tell you something, but I fear I may offend you.' I knew what was coming, and so I asked what it was. He said: 'Well, don't you work on steam engines. You have done some work in electricity. If you stick to it you will do some good work, but if you work on steam engines you are bound to fail.' Another, to whom I showed the advantage of doing away with complicated mechanism, and generating electricity directly, said, after he had watched it for a long time, 'Couldn't you apply this to rotating motion?'

"One of the first impulses which guided me was to produce an absolutely constant motion, which would be independent of any friction losses, or gravity, or temperature changes within very minute limits. I wanted to produce a positive motion, so that I might operate what I called a disruptive discharge coil. With a device which I invented, I was able to maintain a vibration with perfect constancy. The device consisted of a spring which required several tons of force to spring a certain distance, and which was constantly kept in vibration by steam pressure or air pressure. In the beginning I used springs of tempered steel. These steel springs would break, though they had a section of two or three square inches. So I resorted to air springs. The air springs would not break, but they had no constant resistance. Then I made the chambers of the air springs communicate with the outer air. This device yields a constant vibration; and as the force which is driving it is many tons, and the friction but a very small matter, it is unaffected by the pressure, so I have a constant vibration. This is the device which I believe will be used for many purposes—for instance, for governing all sorts of mechanisms, engines and so on. It contains much of interest for scientific men, because with it I am now able to produce currents of perfectly constant frequency.

"When we look at a steam engine, and inquire where the power comes from that drives the steam engine, we will always find that the power comes from a little box, a cylinder with a piston in it, and all the other appurtenances are really but to keep it going. My first idea was to apply the motion of the piston, which is freely movable, to a magnetic field, to move a magnet or coil in a magnetic field, and so generate currents by this direct motion. We can reduce the weight of the engine for the same pressure and the same piston speed to $\frac{1}{30}$ or $\frac{1}{40}$ if not $\frac{1}{60}$ of its weight. We do away with all mechanical frictions.

"The engine designed according to my ideas has a mechanical efficiency of 99¾ per cent. In my construction the dynamo may consist of a simple coil of the maguet and a simpler coil, which is all immersed in the magnetic field. There is no useless wire, consequently dynamo and engine, if they are reduced considerably in weight, increase in efficiency. There is only one engine that can equal it in output, and that is the turbine. With the steam turbine we can obtain an enormous output, and that is the reason why the steam turbine, in my opinion, may be found a valuable adaptation for driving dynamos. In reciprocating mechanisms we can expand the steam at an enormous rate. It is perfectly practicable in these mechanisms, which I have been working up to obtain, if you want, a speed of 100 metres a second; and while I do not contemplate producing such speeds, yet it is quite possible to do it. As I am enabled now to work without a packing, the expansion occurs at an enormous rate; and the engine being of such character that the exhaust can be readily reduced to pretty nearly the atmospheric pressure and the mechanical friction is reduced to such a small figure that we can raise the temperature of the steam very considerably.

"I am now preparing a boiler which will give me up to 350 pounds pressure. If we want to drive motors we must have a long stroke and a slow frequency; if we want to light lamps then we want a very short stroke and a very rapid motion. It is very important in this mechanism, in which the power depends on the square, to obtain as high a pressure as possible. It is more economical to produce rapid vibrations than low vibrations. But, so far as the economy of the dynamo and of the engine is concerned, it is better to produce a long stroke, because a long stroke means a high velocity. I think I am not mistaken in believing that we are going very shortly to have a means at hand of producing twice as much electricity from coal as we can produce at the present time. This is subject, of course, to a test, but I am quite confident it can be done."

Discoursing on the weathering of fuels, Wm. White, Jr., gives information on the loss of value in fuel by exposure to the weather. Bituminous coals are stated to lose fifteen to twenty per cent of their volatile products during the first twenty days after mining. Exposed to a temperature of 284° they lose all their hydrocarbons. W. E. Koch gives the following illustration of the loss in value from storage: "About twenty years ago we had some labor troubles, and in anticipation of a strike our firm laid in a large quantity of coal, the bulk of it being under cover. The strike came on about a year afterward. An analysis showed that the coal when first put there contained about six per cent of ash and about thirty-one per cent of volatile matter. At the end of twelve months an analysis gave, ash sixteen per cent and about twenty-one per cent volatile matter. The coal being put under a producer to make gas put the producer out, and we had to shut down. I think that is the best instance I ever saw of weathered coal. Another case came under my observation. We had some coal sent over from the East Indies to England, it being shipped from Bombay. There were two lots, and both put on the ship at about the same time, one deep down and the other high up in the hold. The coal high up came through in good order. A chemical analysis showed this to have about thirty per cent volatile matter and the other twenty per cent. The one lot of coal made very good gas and good steel, while the other put the producer out. We had a similar experience with blast furnaces. We had an old bank of coke that had been lying undisturbed for a great many years. They said: 'This is all right.' So we put it into the furnaces, and it cost us about $6000 to get it out again."

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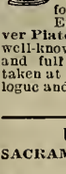

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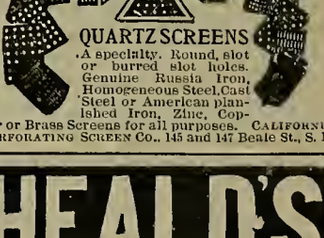

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK DISTRICT.

THE MAHONEY.—*Record:* A pump has been put in the Mahoney mine which handles the surface water from the 200-foot level. This addition to the water-hoisting power is a great help, as the skips can now easily control the water below that point and steadily lower it in any weather. The shaft is drained to near the 550-foot level.

PLYMOUTH DISTRICT.

THE PHILADELPHIA.—*Ledger:* The Philadelphia is one of the properties being worked by the English syndicate. They have just installed ten stamps of their twenty-stamp mill, and started up. The rock they are putting through is taken from an open cut, making the cost of milling per ton very little. W. H. Kroning, under whose supervision the mining and milling is being done, estimates that when the twenty stamps are running, the cost per ton will not exceed fifty cents. By spring the mill will be supplied with concentrators and a blanket plant for saving sulphurets.

Calaveras.

SOLD HER MINE.—Mrs. J. J. McSorley has sold her mine in Chili Gulch to a capitalist, who proposes to develop it.

EMPIRE MILL.—Calaveras *Prospect:* The new mill on the Empire mine, adjoining the Pine Log, started up this week on first-class rock. The indications are good for a first-rate mine.

THE BOSTON MINE.—The old Esperanza, or Boston mine, of Buckeye Gulch, Mokelumne Hill, is being thoroughly prospected after lying idle for fourteen years.

THE BIRNEY MINE.—By a voluntary arrangement between the owners and the employes of the Birney mine the latter have taken charge of the mine until such time as sufficient gold is taken out to settle their several claims. The men agree incidentally to sink the shaft 100 feet, and do other necessary development work. Mr. Poor is the new superintendent of the property and James Denny foreman of the mine.

El Dorado.

SOLD FOR $6000.—*Democrat:* Joseph and Wm. Rupeley were in town Wednesday last, closing up the sale of the Lone Star mine. The mine is situated above Smith's Flat, and was sold by Marshall Hughes and Wm. Rupcley to a San Francisco company, the consideration being $6000.

Kern.

HAVILAH AND VICINITY.—Havilah, at one time the most flourishing mining camp in Kern county, lies six miles north of Keyesville and in the center of one of the principal gold-bearing regions. Most of the mines are located in the granite, just west of a belt of metamorphosed slate and limestone, which stretches for a considerable distance in a general northerly and southerly direction along the slopes of the mountains west of the town.

As late as 1887 a number of mines were worked regularly and in good ore, and several ten and twenty-stamp mills were running. After these were destroyed by fire on the 13th of November of that year, the people seemed to have become discouraged, and today most of the old mines, among them several that produced rich ore to the very last, are lying idle and have caved in. Among these are the Oriental, the Warrington, the Rochefort, St. Charles, Surprise, Eustacia, Confidence, Relief, Sovereign, New World aud Claybank. Work is done from time to time on some of the old claims and new prospects are opened up; but it requires capital and its judicious expenditure to reopen these mines and extract the gold which still remains in unquestionably large quantities. It is the unanimous opinion of men who have worked in these mines that the supply of pay ore is by no means exhausted. Mr. Charles E. Sherman, a gentleman who for years was superintendent of several of these properties, states that work on the Warrington mine was stopped in $16 ore, while the Rochefort averaged $40 a ton to the very last. The ore contained from one to two per cent of sulphurets which ran $400 a ton in the Rochefort and Warrington and $80 in the Clayhank.

The proper way to reopen these ore bodies would he by means of a drain tunnel, which would have to be about 1200 feet long, and to cost $5 a foot. Kern river, only five miles distant, might be harnessed and would furnish electromotive power for all necessary work.

On Bald Eagle mountain, northeast of Havilab, are several good prospects. There is also in this locality an antimouy mine—the Black Jack. Ore is shipped regularly from here to the reduction works in San Francisco, and brings $20 a ton on the dump.

Nevada.

THE DERBEC MINE.—*Herald:* The Derbec mine will resume operations in a few days. The mules, which are down on the ranch, have been sent for, and when they arrive the men will he put on again. The mine employed about thirty men when it closed down, several months ago. The cause of the shut-down was on account of the ditch being blocked with snow.

STAR OF THE WEST.—Mrs. Paul Richards has sold the Star of the West claim to W. W. Waggoner. It is a quartz ledge and lies just west of the Providence and the Home mines. The price paid is withheld.

THE NORAMBAGUA.—*Tidings:* Work has been going on at this mine for over a year upon a tunnel, now about 1100 feet long, to reach the former workings. The employes broke through lately into the old works between the fifth and sixth levels. This will lower the water in the mine, so that it will he practicable to at once begin operations upon a portion of the ledge which has never been worked out. Wm. Campbell, the owner of the Norambagua, will soon put a good force of men at work in the mine, and it will he made an ore producer. The mine adjoins the Perrin's and is located about five miles south of Grass Valley, near Forest Springs.

THE EAGLE BIRD.—The Eagle Bird mine started up last week. Twenty stamps are in operation.

WASHINGTON DISTRICT.

THE GIANT KING.—*Herald:* The Giant King mine, in the Washington district, upon which C. D. Lane had a bond for about six months, is to be worked by the owners hereafter.

Within the last six months the tunnel which taps the ledge has been driven ahead about 300 feet through very hard rock. It is now over 500 feet long and is in on the ledge, which is a mammoth one, about fifty-five feet, and the hanging wall has not yet been reached.

By the terms that have been made, Williamson & Cole, the owners of the mine, have full possession from this time on. They intend to run the tunnel ahead until they reach the hanging wall, when they will drift to the north, where they expect to encounter the pay shoot. This is believed to be the mother lode, which has paid well in various places where it has been worked. The ore is of a low grade, but it is in a condition to be worked economically. To the owners, or to anybody who will be satisfied with reasonable profits and is willing to figure closely, it is a valuable property.

Riverside.

NEW LIFE.—Till recently the mines in the western part of Riverside county have been worked on a par with the pick, shovel and pan plan of the average Mexican miner, operating in this State and Lower California, in which a living only was secured, and all that was wanted. But there is new life and blood in and about these miues, and many of the camps remind one of early California days, with the added improvement of machinery. Many of the best-paying mines have recently passed into the bands of Eastern capitalists, and the stamp mill is heard on every hand. As an example of the development and progress made, Good Hope bas grown from a miner's cabin or two to a nice little village, with a fine new schoolhouse, hoarding-houses, etc., in a few short months.

The great value of these mines is evidenced in the sale of the Good Hope mine recently, for $500,000. With the exception of a few days during the recent heavy rains, when coal could not he hauled, the twenty-stamp mill, put in by the new owners several months ago, bas been running day and night, with two shifts of thirty men each. But little is said by those managing this mine as to the amount of gold being taken out, they, perhaps, thinking this their own business. However, when it is considered that this mill, with a capacity of twenty tons per day, is running continually on $20 ore, and that the men have beeu paid regularly from $3 to $4 per day for months, is pretty fair proof that some gold is being taken out. The forty or more mines are now delving away at a depth of 500 feet, witb plenty of ore in sight.

The Alice, which lies thirteeu miles to the east of the Good Hope, has passed into the possession of a stock company, the principal members of which are J. M. S. Egan, until recently superintendent of the Good Hope; W. H. Griffith and M. Cantan, all recently of Colorado. A new five-stamp mill is being put in, with machinery of a capacity of teu stamps. The plant will be ready to commence pounding out the metal within two weeks. The shaft is only down eighty-five feet, but there is in sight enough $18 to $20 ore to keep the mill running for two years. There are on the dumps 500 tons of ore ready for the mill. The locators of this valuable mine were J. R. Cheatham, L. M. Wilson and L. Crain, the former still retaining an interest. Mr. Cheatham was formerly uight superintendant of the Good Hope.

The Rosalia, or more familiarly known as the Santa Rosa, one of the oldest mines of the group, has a ten-stamp mill in operation, running night and day, ou $15 ore. the ledge growing more valuable as greater depth is reached. This mine is largely owned by Massachusetts men. Messrs. Egan, Griffith and Cantan have interests, however. The output of this mine is bringing good money on the investment.

A new company has been formed to control the Santa Fe mine, and most of the stock having been sold, the mine has been lifted out of the financial embarrassments which have impeded its development heretofore. Work will be resumed on the mine in a few days, or just as soon as the details can be arranged. The grade of ore is on a par with that of neighboring mines. It is proposed to sink a shaft at the end of the big tunnel to a depth 500 feet below its present level.

The old Menifee mine continues to be operated day and night, and is making good money for its owners, with a five-stamp mill running on $10 to $12 ore. There is good profit in $8 ore.

The little Maggie has a ledge of only eighteen inches iu thickness, but the ore is of high grade, yielding $60 to the ton. The mine is being rapidly developed.

The Gold Prince, a mine but a few hundred yards from the Good Hope, and which has been lying idle for the past two years, for want of capital to develop it, is considered equally as valuable as its big neighbor.

Siskiyou.

GETTING READY.—A Henley correspondent of the Yreka *Journal* furnishes the following:

The fine weather of the last two weeks bas stimulated business. The gulch miners are bringing in small vials of gold dust. Ditch cleaners are at work, and prospectors are getting ready for an early start. Our depot is full of machinery, and it will not be long until we can hear the stamp of two mills at work on blue gravel, one at Jillson & Co.'s mine, the other at the Black Jack mine.

It looks now as though little will be done by the Porphyry Dyke men this season. They are still buying up property in that vicinity, and it is not likely they will do any work that will improve adjoining property, until they have secured all they want of it; then look out for the biggest plant in the county.

San Diego.

CARGO MUCHACHO.—Thomas Wiltyer has sold to Z. H. Lowman, for $3000, the Fair West, Eastern Exteusion, Homestake, American Girl and Black Quartz mines, in the Cargo Muchacho mining district.

NEVADA.

Lander Co.

THE CLIFTON TUNNEL.—The Austin *Reveille* is informed that the Clifton tunnel is now being run through ledge matter and everything looks favorable to the uncovering of a body of ore.

ARIZONA.

COPPER PROPERTY SOLD.—*Miner:* John W. Gerritt, the miuing man of Mineral Park, this week closed the deal for the Redenour copper property near the Grand Canyon of the Colorado. The price named is away up in the thousands. One-third of the purchase price has been paid down, and the balance will follow shortly. The purchasers are John R. White, of the Ninety-three Mining Company, Mineral Park, and the Graphic-Carbonate, Kelly, New Mexico; Howard R. Deacon, wholesale lumber merchant, Philadelphia, Pa.; Howard L. Haines, capitalist of Philadelphia, Pa.: Jo Davidson, wholesale jeweler of Philadelphia, Pa., and treasurer of the famous Utica mine of Colorado; Mr. Nealy, a wholesale lumberman of Philadelphia. The new company will begin work immediately. This sale was accomplished in less than a month from the time the parties first began negotiations.

TYSON MINERS HAPPY.—*Gazette:* Word comes from Tysou mining district that miners there are jubilant over the late rains. Dry washing has stopped in consequence, and prospectors are scattered between Harqua Hala and Ehrenburg. In the intervening valley, thirty miles by sixty, placering has gone on many years. Quartz mines yield gold in arrastras. G. W. Ingersoll of Colorado has a steam arrastra running. In Plomosa, east of Tyson, there is considerable activity; also in New Weber, south of there. The Gray cement-crushing mill is about to start near there, to treat the placer cement beds. John Agard and George Wilder are about to sell their mines at Chloride to Eastern parties. Every mine explored seems to justify a mill. Some 200 men are in the bills. Colorado parties will soon start a 40-stamp mill at Frost's claim near Tyson. Water has to be hauled to some of the camps and costs four cents per gallon. It is struck at a depth of twenty-eight feet in Tyson. Gaietta grass is in bloom and stock are doing well. Mountain sheep furnish fine meat. Tyson postoffice is fifty miles west of Harqua Hala, and twenty-two miles east of Ehrenburg.

NEED OF A MINING LAW.—Phœnix *Gazette:* The hill introduced by Mr. Marshall in relatiou to our mines and mining is one that should receive the approbation of the Legislature without delay. For years Arizona has needed a statute regulating and governing the location and holding of mining claims. Under our present practice a man or party of men can start out with a burro and a lead pencil, and by reason of their priority in a section containing evidence of mineral, locate aud hold a whole township of territory to the exclusion of others. It is a fact that in many of the mineral districts of Arizona a certain class of so-called mining men make it a business year after year to locate and relocate scores of mining claims upon which they are uuable and unwilling to perform one dollar's worth of development work. The United States law is evaded, and, as far as Arizona is concerned, is a dead letter with the average prospector. Now that our gold districts are attracting the attention of the investor, a law should be euacted protecting and encouraging the bona fide prospector, aud putting a quietus on the pencil artist of the mining regions.

COLORADO.

BIG MINING DEAL.—John F. Smith bas sold his one-fourth interest in the Moose mine at Cripple Creek to J. F. Maynard of Utica, N. Y. The amouut of stock held by Smith was 162,000 shares and the price paid was at the rate of 50 cents a share, or $81,000 cash. The experts who examined the property for Mr. Maynard placed the value of the mineral in sight at $256,000. Dividends to the amount of $84,000 have been declared in the past twelve months. This sale was the largest spot cash mining deal ever made in Cripple Creek.

AN ANNUAL STATEMENT.—The Colorado Central Consolidated Mining Company, in its aunual statement, says its debts amount to $125,000—$500 for labor, $100 for office expenses, $6000 for legal services, $116,500 contested judgment in favor of John Turck and other debts that will not amount to more than $2000.

IDAHO.

WARRENS PLACER DEAL.—Boise *Statesman:* George Riebold, from Warrens, says the sale of a tract of Warrens placer ground, owned by himself, ex-Governor Willey and others, has been consummated, the purchasers being Philadelphia capitalists. The tract embraces about 200 acres of ground, some of which has been worked and found to be very rich. The consideration, it is understood, was $26,000.

Mr. Riebold says oue man took forty-five ounces of gold from one of the claims included in the sale in eight hours. Chinese who own placers a short distance down the creek have taken out $2,500,000 in the past ten years. Mr. Riebold says it is a fact that two of the Chinese took out $1000 in one day.

The Philadelphians have purchased a dredging machine with which to work the ground. The machine is now at Pocatello. It will be shipped in as soon as spring opens.

The William B. Knott mine, recently sold by ex-Governor Willey to E. B. True for $10,000, is being worked with good results.

CAMAS NO. 2.—Hailey *Times:* Supt. Wood of the Camas No. 2 mine and mill came to town to-day, bringing a gold brick that weighed exactly 17½ pounds. At $16 per ounce Troy, the brick is worth about $4000. This was the result of fifteen days' run on fifteen stamps.

Another brick worth about $1500 having been brought in a couple of weeks ago, this makes about $5500 worth of bullion brought in. A cleanup is now going on at the mill, which will doubtless result in $1500 worth of gold additional.

In addition to the gold, sixty tons of concentrates have been shipped since the mill started up. These are worth $80 per ton, and amount to $4800. We thus have a total of about $12,000 for about twenty-five days' run of fifteen stamps. Mr. Wood says that during that time he ran 506 tons of ore through the mill. His expenses average $100 per day. He expects to do much better the current month than he did last, especially as he will run twenty stamps instead of fifteen.

YELLOW JACKET G. M. CO.—The Yellow Jacket Gold Mining Company, a Denver-New York combination, has its new twenty-stamp mill in operation and will add ten more stamps within sixty days. This mill was purchased last fall to replace the plant which was destroyed by fire.

MONTANA.

GENERAL MINING NOTES.—Butte *Inter Mountain:* W. E. Hall, formerly superintendent of the Alice, is engaged in putting the Poulin mine in good condition, and the rumor is again revived that the Poulin, Pacific and other properties in that locality are to be consolidated in one company, with Mr. Hall as superintendent. The people of Butte hope that the rumor is correct.

L. A. Dunham came in from Richmond Flat yesterday, bringing with him two bars of gold bullion—worth about $6500—from the Revenue mine. Mr. Dunham says that the prospects for the future of the Richmond Flat district are very bright, but all of the mining ground in the district is patented. No work had been done there for years until the Revenue people proved, by development, the value of that vein. The Revenue is now down to a depth of 300 feet, and with a milling capacity of from 40 to 45 tons a day will produce about $30,000 a month. The Revenue was recently sold to the present owners for $100,000 by the Turner Bros. and others. S. K. Knox, the owner of the Monitor, is sinking a vertical shaft on that property, and at the same time working in such a way as to make the ground pay all of the expenses. A recent shipment of ore from the Monitor assayed $156 to the ton. In the same shipment was a sample of 500 pounds that assayed $2000 to the ton. The owners of the Flat mine, in this district, are also preparing for active work in the future, as are the owners of various other properties in that locality.

NEW MEXICO.

HANOVER. — Silver City *Enterprise:* The new smelting plant of the New Mexico and Arizona Smelting Company was started on the first of this month. The smelter is handling 63 tons of ore per day on an average.

OREGON.

Josephine County.

A REPORTED STRIKE.—A strike in the old Dry Diggings mine, three miles east of Grants Pass, is reported. This is one of the oldest mines in southern Oregon, large amounts of gold having been taken out of it in early days, and it is still being mined every winter with good results. The main ledge has never been found, though it has been hunted for for many years. Two giants have been at work this winter on the property. Two years ago two young men found a pocket far up the hill, above any work which had ever been done on the property before, and took out sixteen ounces of gold from it. Taking up that clue, three miners began looking for the source of the lead this winter, with the result of finding a leader to what is supposed to be the main lead to the Dry Diggings mine. Some very rich quartz and dirt has been taken out, as high as $7 per pan being realized.

WASHINGTON.

GOLD CLAIMS IN DEMAND.—*Review:* A report is in circulation among mining men that the famous "Eureka" claim on Slate creek, in the Cascade range, bas been bonded to a coast syndicate for $100,000. The Eureka is the remarkable ledge of rotten quartz from which it is claimed $12,000 in golden nuggets was taken by its discoverers last fall before the snow came. If it is anything more than a big pocket the general idea is that $100,000 is a beggarly sum to offer for it.

While Slate creek is certain to be dammed by the stampede of gold-seekers iu the spring, it will not be the only part of the Cascades that will be explored pretty thoroughly this year. All along the Methow valley there will be dozens of them. Some are going farther up the country, near the boundary line, where few white men bave ever left their footprints. It is claimed that one man, who was iu there last autumn, took out $14,000 in a single month from a rotten quartz ledge.

Letters received from Everett, Tacoma and Seattle say that many of the mining men on the Sound are getting the Alaska craze. Spokane prospectors do not seem to be tempted in that way. So far as is known, none of them have yet decided to go. They say it is too expensive a trip and too hard a country to work. As a business proposition they prefer hunting gold in central Idaho, the Okanogan country or the Cascades.

Coast Industrial Notes.

—The Fair executers will proscoute the work of reclumation of the Nerth Beach property.

—The *Railway Age* says that the story that Debs is going to San Francisco is "pure humbug."

—New Westminster is manufacturing pipes for the Cariboo and Horsefly companies' hydraulics.

—The coast steamship war makes $4 the present possible passage price from this city to Seattle.

—The Chinese Six Companies are getting Chinese on the coast to draw their money and ship it to China.

—The electrical workers of San Francisco organized under the auspices of the Labor Council last week.

—A tri-weekly line of steamers between Oakland and the Sacramento and San Joaquin river ports is projected.

—The Southern Pacific Company has contracted for 700 ventilated fruit cars for use next season. They will not require the use of ice.

—The Currie Iron Works at New Westminster were sold for $5000, and the book debts for nine cents on the dollar. The works were assessed for $19,000.

—Redo & Co. are reported about to put on a line of freight steamers between Mexican and South American ports in opposition to the Pacific Mail Steamship Co.

—D. B. Hanson, Pacific coast representative of the Edward P. Allis Co., Milwaukee, has secured letters patent on an offsetting sawmill carriage—a clever device.

—The *Republican* hears that the employes of the Truckee Lumber Company are to have their wages reduced twenty per cent. The report is denied by the company.

—Grain freights out of San Francisco are quoted at 21 shillings. There are now 83,767 tons of discaraged bottoms in port, as against 43,933 tons at the same time last year.

—The Northern Pacific receiver's report for November shows balance for October, $1,378,917; receipts, $3,896,338; disbursements, $2,100,577; balance to December, $1,735,760.

—F. G. Curtwright is overseeing the installation of a 2500 H. P. transmission electric plant at Bakersfield, power being secured from the Kern river, twelve miles distant.

—Active arrangements are in progress for a steamship line between Portland and the Orient, to be operated in connection with the O. R. and N. Company and the Great Northern railroad.

—The Pacific Storage Battery Company has been incorporated in this city; directors—Thomas Addison, Robert B. Elder, Fred F. Barhour, F. M. Ray and Samuel E. Kearney. Capital stock, $20,000, all subscribed.

—The ice crop in the Truckee river, representing a present invested capital of $600,000, is now being "harvested." It is Truckee's only water industry and gives employment to a large number of men.

—The Monarch Consolidated Gold Mining Company has filed articles of incorporation in Oakland. Capital stock, $500,000, with P. C. Gayetty, J. W. Woodward, F. C. Watson, A. M. Benham and W. R. Thomas of Oakland as directors.

—The new J. J. Cousin's drydock was successfully launched at the foot of Devisadero street, this city, last week. It is 180 feet in length, 61 feet wide and 27 feet high, contains 24 watertight compartments and is of unusual lifting power. It is a California construction throughout.

—On the Mexican international railway construction has commenced on the branch from Monclova west to the mining town of Sierra Mojada, about 160 miles. The line was partially graded in 1892. Work has also been commenced on the branch from Riata southeast to Monterey, 60 miles.

—Three forty-foot guns are en route for Fort Point and Lime Point. They weigh fifty-seven tons each, have a diameter of 46 inches, and a circumference of 12 ft. 2 in. at the greatest point. They are expected to furnish adequate defense against any marine foe that would elude the new mortar batteries.

—The total expenditure of the Escondido irrigation system to date has been $136,408.10. The cash receipts from the sale of bonds have been $151,070, leaving a balance of $14,661.90 on hand. There is $76,440 due on bonds, and this, with the amount on hand, leaves $91,101.90 as the sum available for completion of the system.

—The Santa Clara Valley Railroad Company has incorporated with a capital stock of $300,000. Directors—F. Smith, president; L. A. Sage, P. R. Sterne, W. O. Watson and W. P. Hentry. The company proposes to build sixteen miles of standard gauge road from San Jose to Saratoga and to Santa Leland.

—There are sixty-six hot springs in Nevada and a belt of hot water underneath the State, which, if tapped by artesian wells, would prove of great commercial benefit to the State. Past legislatures have attempted to foster the enterprise by paying bounties to successful artesian well sinking, but they were too small to be of any practical good.

—By a vote of 36 to 25 the United States Senate voted last Saturday to inaugurate the project of laying a cable from the Pacific coast to Hawaii. An amendment to the Diplomatic and Consular Appropriation bill was made, giving $500,000 for beginning work on the cable and authorizing the President to contract for the entire work, estimated to cost $3,000,000.

—The Californian Water Works and Irrigation Co., Ltd., is an English corporation operating in Layo Co. About eight miles of canal are now under active construction, of which several miles are completed. The total length of canal will be eighty-three miles, and it is estimated that it will irrigate 332,000 acres of land. It is expected that eighteen miles of the canal will be finished by next spring.

—The scheme to tap and partially drain Goose lake, which is situated in this State and in Oregon has several times been agitated and met by strong opposition. Now it comes up in the shape of a bill introduced by Congressman Geary, granting the right of way to construct a canal from the lower end of the lake, in a southeasterly and southwesterly direction to Upper Pitt river, for irrigation and other purposes.

—Jas. S. Brownell, Western agent Pruc Vanning Machine Company, 132 Market St., San Francisco, reports the following sales: Osborn Hill mine, Grass Valley, Cal., three 4-foot patent lip belt vanners; Virginia City, three 4-foot plain belt machines; Eureka & Excelsior mine, Sumpter, Baker Co., Or., one patent lip belt vanner; Muzatlan, Mexico, eight 4-foot plain belt vanners; Australia, three 4-foot plain belt vanners.

—The extension of electric railways in the past year in San Francisco is noticeable. On Mission and Kearny streets, two prominent thoroughfares, electric cars have been recently placed, and in the western part of the city two more lines are in process of construction. This week a fifth new electrical railway project will be begun, to be completed next July. This road will be over four miles in length, beginning at Bay St. and extending through the southwestern part of the city.

—The Colorado River Irrigation Co. has a mammoth scheme to reclaim an arid region of 1,000,000 acres in southern California and 500,000 acres in Baja California, reaching from Indio, San Bernardino Co., to the Gulf. It is proposed to begin work on the main canal next week. It will be 250 miles long, and for the first twelve miles will be 156 feet wide, carrying ten feet of water. The initial point is "Pot Holes," about ten miles from Yuma. The water to be used is from the Colorado river.

—During the season of '94 the Cutting Fruit Packing Co. of Colton, Cal., bought of the fruit growers 2,955,553 pounds of green fruit, for which they paid out $25,116.74, or an average of nearly $20 per ton. For labor in handling this fruit they paid out $19,335.20, most of which was kept right at home and was distributed where it would do the most good. The company packed for the season 1,083,000 cans of fruit and their shipments for the season up to date are 181 carloads of dried and canned fruits.

—The Renton, Wash., coal mines are to be reorganized on the co-operative plan. The capital stock of the company is to be $100,000, divided into 1000 shares of $100 each, payable in monthly installments of $10, or in full, whichever the subscriber prefers. One of the prime features of the enterprise is right of employment to shareholders, limitation of number of shares, steady employment to those who perform their duty faithfully. In addition, the company will aim to have eight hours constitute a day's work and pay a full day's wages.

—Articles of incorporation of the San Francisco and San Joaquin Railroad have been prepared by the secretary of the committee of promoters of the road. The capital stock is placed at $6,000,000, divided into 60,000 shares of the par value of $100 each. The length of the road is estimated at 350 miles, and it is set forth that $350,000 have been subscribed, to meet the legal requirement of $1000 per mile subscribed, of which ten per cent has been actually paid in. The total amount of subscriptions has reached $2,200,000.

—The Spokane *Chronicle* says that the country extending from Spokane to the Sound has been hard hit by the dull times. At Spokane former millionaires are penniless, with nothing to do. It is said of one man, who owned a brick block, that he is now glad to get the janitorship of the building he formerly owned. Another man, who had a salary of $500 per month and owned a vast deal of property, is without a cent and keeps himself employed by keeping books, without pay. One informant said that one man was especially happy because he owed only $5000.

—The record of the steamer Flyer, plying between Tacoma and Seattle, for the year 1894, is probably without a parallel in the United States. Her running time, from wharf to wharf, is one hour and twenty-five minutes, and she makes four round trips a day, six days in the week. During the past year she made 1249 round trips, covering a distance of 68,695 miles. Not a single trip was lost, not an accident of any kind occurred, and the total time lost during the year was forty-three minutes, showing that her arrivals and departures were like clockwork.

—The Edward P. Allis Co. branch office, 31 Main St., this city, have received an order for a cross-compound condensing engine of the Girder frame horizontal type, with Reynolds-Corliss valve gear. Cylinders are to be 14 and 26 inches in diameter by 36-inch stroke; drive wheel, 16 feet diameter by 30-inch face; weight, 14,500 lbs. They are putting in a 36"x120" water jacketed furnace for the Standard Smelting and Refining Company, of Durango, Colo., and two 36"x120" water jacketed copper furnaces, with complete Reynolds-Corliss engine outfit for the Detroit Copper Mining Co., at Morenci, Arizona.

—Judgments in the Superior Court in Seattle, Wash., are still piling up against D. T. Denny and his sons. Recently defaults were signed in two actions by the Northwest General Electric Company and one by W. J. Grambs on assigned promissory notes aggregating $34,791, and a confession was made in a suit on a $9000 promissory note executed to George F. Gund. The notes held by the electric company are dated March 1, 1893, and are as follows: Northwest General Electric Company, $24,000; L. H. Griffith ($20,000, $12,000, $10,000, $8,750, $5,250), $56,000; F. T. Blanck, $4,134.75; Jacob Furth, $656.25; total, $84,791. The amount with interest and attorneys' fees is now in the three former cases $97,298.52, and in the Gund case $9,455.62, bringing the grand total to $106,753.12. This sum, together with the confession in the cases of the Puget Sound National Bank and F. T. Blanck, makes a total of $409,372.58.

—The following, furnished by the secretary of the Tacoma, Wash., Chamber of Commerce, is a statement of the Tacoma smelter for the month of January, 1895: Number of men employed, 76; pay roll, $5556.16; wood choppers and teams, $304; total, $5860.16. Product—4000 bars bullion weighing 412,884 pounds; copper matte weighing 182,900 pounds. Contents: 2,059.40 ounces gold at $20.67 = $42,567.80; 46,238.62 ounces silver at 60 cents = $27,743.17; 448,167 pounds lead at $3.022 per cwt.=$13,557.05; 72,174 pounds copper at 9½ cents per pound=$6,856.53. Total, $90,724.55.

—The two largest locomotives in America go into the service of the Southern Pacific Co. on the Mountain division next week. The weight of each engine without the tender is 169,000 pounds; the total weight, ready for service, is 250,000 pounds. The driving wheels, of which there are four pairs, are fifty-one inches in diameter. The boilers are seventy-two inches in diameter, the steam cylinders twenty-two inches, with a twenty-six-inch stroke. The locomotives exceed in size and strength the "decapods" used on the "switchback" division of the N. P. R. R. some years ago, and will be used in the Tehachapi and Sierra Nevadas.

RUPTURE!

It has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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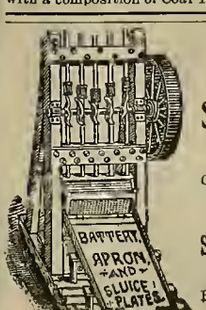

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That which persuades the compass to point northward and a "dipping needle" to incline its northern end downward is the magnetism resident in the earth itself; and this is probably permanent. There are, however, certain deflecting forces which operate either regularly or irregularly to cause both of these instruments to vary in their indications. There is similar interference with other magnets, arranged to test the strength rather than the polarity of the earth's magnetism. Some of these disturbances, Professor Bigelow thinks, are due to an influence proceeding along curved lines from the polar regions of the sun, and impinging on our globe at right angles to the plane of the earth's orbit. But it has been strongly suspected by various authorities that certain other effects, such as the diurnal oscillation of the needles, are produced by a thermal or electric influence, following a straight line from the sun to the earth, and hence parallel with the solar light rays. That the eastward swing of the compass every morning should begin at an earlier hour in summer than in winter, and that the range from the most easterly position to the most westerly (which latter is usually attained between noon and 2 P. M.) should, in our hemisphere, be more ample when the sun is north of the equator than when it is south, has lent strength to that suspicion. The notion that this oscillation was caused by electricity excited in our atmosphere by "convection currents"—that is, air set in motion by the sun's heat—has been widely entertained, and still has its advocates; but since Hertz confirmed Maxwell's electro-magnetic theory of light there has been a growing disposition to think that the diurnal swing of a declination needle resulted from a direct electric radiance, nearly or quite identical with the luminous radiance.

The instrument known as an actinometer formerly employed only chemical means for detecting the intensity of the sun's rays, and only chemical or actinic effects were thus measured. But a long series of experiments in this particular field has led Messrs. Rigollot and Marechal to invent an actinometer in which a perceptible electric current is set flowing by solar action through a copper strip from the end of the instrument which is exposed to strong sunlight toward the other, which is shielded from light. This instrument has been developed sufficiently to transmit signals over a wire for more than six miles. When luminous rays were focussed on the sensitive plate of the apparatus at one point, a galvanometer in the circuit at another point was instantly deflected; and as soon as the light was turned off, the needle returned to its normal position. If the air, or the earth, is similarly influenced, then, it is argued by M. Marechal, there should be a system of electric currents always flowing from the darker regions of the earth's surface toward that area which is most brilliantly illuminated; an area which is continually shifting through the earth's axial rotations. Whether the observed facts fit this theory closely is perhaps open to question. But the phenomena here described are highly interesting in themselves, even if they do not directly explain the diurnal swing of the magnets. Indeed, they may have a more practical value, either in establishing a new system of telegraphy or the storage of free energy for commercial purposes, or both. There is a strong appeal to inventive genius here.

MASCART found that an electric glow lamp of thirty-two candles set fire to cotton wool saturated with India rubber, and packed around it, in two minutes, to black silk in six minutes, and to a double layer of cotton cloth in two minutes, says the *Gas World*. The same materials not saturated with India rubber did not take fire. Capt. Exler of the Austrian army now finds that a sixteen-candle lamp, sunk in paraffine, reaches a maximum temperature of 94° C.; one of twenty-five candles 101° C. A layer of gunpowder, ecrasite or pulverulent pyroxyline is not set on fire by this; the ecrasite melted and the gunpowder lost all of its sulphur. If the material be spread on a substance—for instance, wood—which is opaque to heat rays, the action is more marked when the lamp is brought very near to it; the ecrasite melts, the pyroxyline darkens, the gunpowder loses its sulphur, and the niter melts and the wood chars. Two lamps in a cavity of wood get up a temperature of 215° C., but the explosives did not go off, though they decomposed. When the cavity was filled with water it boiled in fifteen minutes. The spark produced on turning off the flame only kindles these explosives when they have become very dry, but the spark produced on switching off a feeble resistance between two lamp wires can do so readily. If the lamp breaks, pyroxyline or gunpowder does not ignite, but an explosive gaseous mixture will; whence, in dangerous surroundings, the lamp wall should be thick, and the lamp should never be brought too near combustible material.

Erratic Electric Engine Governing.

The *Electrical Engineer* notes that the time and ingenuity which have been expended in the designing of governors for regulating the speed of electric lighting engines have resulted in a number of very sensitive types. But if all the care bestowed on them is to be nullified by extraneous conditions not contemplated in their design, much of their value will be lost. A case of this nature was recently brought to our attention, which, we think, merits further inquiry, and which we deem of interest to all those operating direct connected engines.

The engine and the dynamo in question are directly connected, and when the plant was installed and started the engine performed in a satisfactory manner both to the purchaser and to the maker's representative. After a time complaints were received because of unsatisfactory regulation. From the character of these complaints it was concluded that there might be some defect in the governor, and the manufacturer incurred the expense of sending a complete new governor, requesting that the old one be returned. The new governor was placed, adjusted and the plant started, and the report came back that the regulation was perfect. In the course of a week or ten days complaints were again entered on the score of unsatisfactory regulation of the governor. The thought then occurred to the engine builders that possibly the governor was affected by magnetism. They conferred with the makers of the dynamo and were told that in their judgment such could not possibly be the case.

It has since been learned that a monkey wrench will be held fast to the rim of the governor wheel when the engine is under full speed. The speed of the periphery of this wheel is about 5400 feet per minute. When the engine is in service the force is sufficiently strong to pull a man, standing at the front or crank end with a wrench held out within two feet, into the engine. Any magnetic substance, such as iron or steel, if placed on the throttle or valve wheel, is held firmly. The distance between the center of the dynamo and the eccentric is about forty-eight inches.

The question therefore arises whether the governor can be affected by the stray magnetism of the dynamo, and whether such a condition in a plant as indicated above may not materially effect the cost of light.

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The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XXII.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

1890.—The total capital invested in the petroleum business in California was $2,186,958. Total number of producing wells, 89. Illuminating oil sold for $2.55 and fuel oil for $1.43 per barrel.

A new oil field was developed in Los Angeles county, two and a half miles southeast of Newhall. The new district was named "Ellesmere," referred to in the following newspaper clipping:

"The Newhall oil district is situated thirty miles west of Los Angeles, on the main line of the Southern Pacific Railroad. The main oil belt extends for about eight miles through the San Fernando mountains, in a southeasterly and northwesterly direction, the formation being entirely of sandstones and oil-bearing shales. Developments have recently been commenced on the east side of Newhall in what is known as the Ellesmere district. The remarkable depth of the oil-producing sand has not been excelled anywhere, ranging in thickness from 350 to 785 feet. The first wells bored, fifteen years ago, still yield large quantities of oil, with no signs of failing. At Pico canyon there is a strip of land 840 feet wide and 3800 feet long which has yielded more than one million and a half barrels of oil and still produces, without any appearance of giving out. There are now fifty wells in this section with a daily aggregate production of 900 barrels, which amounts is steadily increasing."

The year's yield of California petroleum was 307,360 barrels, and the total State production was 3,590,622 barrels.

1891.—There was an oil excitement this year in Humboldt county at the old Petrolia and Mattole districts. On the 13th of April a company was organized with a capital of $200,000. A well was soon commenced, but at last accounts no material success had been met with.

The State yield for the year was 474,500 barrels, and the grand total since the commencement in 1869 was 4,065,122 barrels.

While this is but a small yield as compared with that of Pennsylvania and New York, still it is very important to our State, so deficient in fuel.

In April, 1894, the British tank steamer Bawnmore arrived in San Francisco with her first cargo of crude Peruvian mineral oil, amounting to 20,000 barrels.

A full shipload would seem to be a very considerable quantity, but to equal the output of California for sixteen years she would have to make 203 full voyages, and there would still be a deficiency of 5126 barrels. To accomplish this she must make nearly thirteen full voyages a year, which is an impossibility; that is to say, if she had been employed during sixteen years to her full capacity in conveying California petroleum to Peru, she would have fallen far short of the task.

These calculations will convey a good idea of the magnitude and importance of the petroleum production of California. What it may become in the future, who shall predict?

The estimated State production of asphaltum was 50,000 tons, and the capital invested in mining, transportation and application was $2,500,000.

1892.—A special train of eleven cars loaded with 150 tons of refined Buena Vista asphalt, refined at Asphalto, was sent to Sedalia, Missouri, where it was used for pavements. Shipments were made during the same year to Portland, Denver, Ogden, Kansas City, Los Angeles and elsewhere.

1893.—Of the numerous State localities only five counties were producing asphaltum, as follows: Kern, San Luis Obispo, Santa Barbara, Santa Cruz and Ventura.

GREAT BRITAIN'S net imports of gold amounted to $59,586,875 in 1894, as compared to $26,662,270 in 1893. That's where a lot of our gold has gone.

No. 10.

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R. Ld Duncan Jr Supt

OFFICE OF
ALASKA TREADWELL GOLD MINING COMPANY
Alaska Mexican Gold M'g. Co.

Douglas Island, Alaska, July 31st. 1894.

William J. Chalmers Esqr.
Pres. Fraser & Chalmers.
Chicago. Ill.

Dear Sir:-

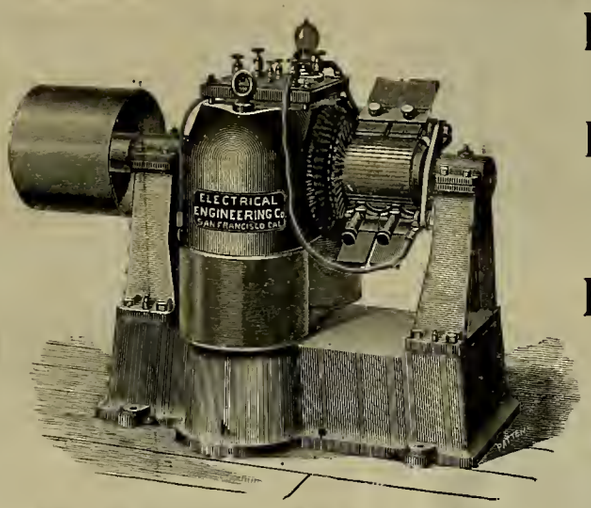
Your letter of July 7th. is duly received.

In regard to your enquiry regarding our Riedler Compressor, supplied by your Coy, over eight months ago, I must say, that the Compressor is giving excellent results, and every satisfaction, while running either by steam, or water power.

During the last twelve years, I have seen operated, and have operated, many different makes of air Compressors, including the Eclipse, Reliance, Burleigh, National, Rix, & Firth, Ingersoll Sargent, etc. etc. and in no instance, have any of the above given the results of the Riedler. Therefore, I have no hesitation in saying that the Riedler, is the best, and most economical Compressor on the market today. We have made comparitive tests here, of the Ingersol Sargent, and Riedler, which show, greatly in favour of the Riedler.

Yours very truly,

R. Ld Duncan Jr
Supt.



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SECRETARY HERBERT will ask Congress for authority to transfer to the Interior Department all the wooded lands not needed for naval purposes. Live oak timber was once the chief material employed for our warships, and to insure a supply of it the government set apart large tracts covered with trees in some of the Southern States. In these days of steel hulls the need of this provision has ceased, and, in fact, there are now lying at the various navy yards thousands of feet of seasoned live oak that can neither be used or sold. Naturally, the Navy Department long ago ceased to concern itself with watching its live oak tracts, and there is no evidence to show that trespassers and squatters take advantage of this fact, while in some cases the reservations may obstruct settlement.

THE public revenues of a State cannot be better employed than in the exploration of her mineral resources by the best equipped geologists and mineralogists that can be secured for the service. And, in addition, an appropriation should be made to build up a State mineralogical, geological and archæological museum, while yet there is material.—Black Hills Mining Review.

The Russell Process.

For information concerning this process for the reduction of ores containing precious metals, and terms of license, apply to

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Ishpeming	Michigan
1316 Eighteenth Street	Denver
Sherbrook P. O.	Canada
Apartado 830	City of Mexico

Market Reports.

The Markets.

SAN FRANCISCO, Feb. 14, 1895.

A little weakening in lead and copper and a hovering of silver around the 59¾ mark characterize the week in those metals. There is a heavy movement from all quarters of gold to New York. Over $5,000,000 left London for New York this week and about half that amount has been called for from this city, the local supply being principally shipments direct from the Sub-treasury. Gold is coming into the United States mint here at the rate of $50,000 daily. The present movement is responsive to the proposed placing of a new issue of $65,000,000 government bonds.

New York Metal Market.

NEW YORK, Feb. 14.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.
COPPER—Brokers', 9¾c; exchange, 9.90c.
LEAD—Brokers', $3.02½; exchange, $3.12½.
TIN—Straits, 13¾c; plates, ——c.
SPELTER—Domestic, $3.20.

New York Prices.

NEW YORK, Feb.14.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	27⅝	59¾	9 75	3 00
Saturday	27¼	59½	10 00	3 02½
Monday	27½	59½	.....	.....
Tuesday	27⅜	59⅝	.....	.....
Wednesday	27⅜	59¾	9 75	3 02
Thursday	27⅜	59⅞	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	12½c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.89
Refined Silver, per ounce	59⅞
Mexican Dollars, nominal	48@48½

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lh	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per hx	5 25	@	6 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
NAILS.			
Wire			$2 90
Cut			2 65
PIG TIN.			
Per lh	15	@	16 00
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do. " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			12 50
Wallsend			7 00
Scotch Splint			8 00
Brymho			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	12 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'		75c	₱ bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO — WHOLESALE.			
Redwood, Flumiug	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, Feb. 14, 1895.

Comstocks were firmer during the week; the amount of business was limited. The Holmes Mining Co. is about to sell the tailings at its Belleville mills, and the quantity of low-grade ores accumulated. Supt. Leggett of Bodie will attend the meeting of the Standard Cou. next Monday. The Standard people are preparing to put in a new generator, which will run the pumps and hoist, the power being carried through the tunnel. The pump at the cyanide plant will also be worked by electricity and an electric motor will raise the cars loaded with tailiugs to their present level, by means of a cable and temporary tracks, after which they will he pushed into place by the men, as they were last summer.

The sixty-four men working at tbe Crown Point will have an enforced vacation the rest of the month, waiting for repairs to the hoisting machinery, which was badly smashed last Monday. Bullion valued at $20,000 has been received from that mine on January account.

The *Enterprise* reports a strike of some importance in the Chollar mine. The new ore body is about 40 feet below the 550 level. The last official letter from the Chollar said "the winze below the 550 level is down 37 feet. The east side is in quartz of fair assays, value samples running from $20 to $30 per ton."

Since that publication the vein of quartz was working toward the east. A drift was started and extended fifteen feet. The face of the drift is in ten feet of ore, which, it is thought, will average between $30 and $40 per ton at the battery.

The vein contains some rich places, although it is not pockety in its nature. It is thought that there are no old workings in the neighborhood to interfere with the vein now being followed. The find is within twenty-eight feet of the Hale & Norcross line.

The hullion statement of the Chollar for the month of January is as follows: Worked at the Nevada mill 960 tons of ore. Gross proceeds in hullion, $23,580.53. Cost of reducing, $5760. Net proceeds in hullion, $17,820.53. Assay value per ton, $33.49. Gross average per ton, $24.56. Net average per ton, $18.56. Mill worked up to 73.3 per cent.

In the Savage, on the 950 level, the last crosscut from the fourth floor of the north upraise is advanced thirty-seven feet; face in quartz assaying $7 per ton. On the 1100 level, in the north drift from the east drift, they continue to extract fair-grade ore from the sill floor up to the tenth floor.

On the 1050 level in the south drift from the east drift they are extracting ore of good quality and the grade of the ore has improved in stoping upward from this level. In drifting south from the east crosscut they are also finding streaks of good ore. From the face of the south drift on this level they have advanced a crosscut west fifteen feet, and the last three feet are in ore of good quality. During the week they have hoisted 120 cars of ore. Car samples average $35 per ton.

The following illustrates the changes of the week:

MINES.	7	14
Alpha	$ 08	.....
Alta Consolidated	38	$ 35
Andes	39	27
Belcher	38	39
Best & Belcher	.....	72
Bodie	85	91
Bullion	.....	10
Challenge	.....	.....
Chollar	39	50
Confidence	70	.....
Consolidated California and Virginia	2 95	2 80
Consolidated New York	.....	.....
Crown Point	.....	.....
Exchequer	04	.....
Gould & Curry	30	28
Hale & Norcross	76	82
Justice	.....	09
Mexican	74	.....
Opbir	1 40	1 45
Overman	.....	14
Potosi	45	52
Savage	.....	40
Sierra Nevada	.....	32
Union	46	45
Utah	.....	.....
Yellow Jacket	.....	45

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING FEBRUARY 5, 1895.

533,521.—PETROLEUM FURNACE—Wm. Bootb, S. F.
533,788.—RULER—A. S. Cooper, Santa Barbara, Cal.
533,792.—BUTTON-HOLE GUIDE—C. Donovan, S. F.
533,587.—PRESERVING TIMBER—J. S. George, Newport, Ogn.
533,642.—CAN OPENER—J. Gould Jr., S. F.
533,803.—BOILER FEEDER—M. Gregson, Philomath, Ogn.
533,534.—SAWMILL SET WORKS—D. B. Hanson, S. F.
533,645.—CARAMEL BOX—W. E. Henry, S. F.
533,646.—ROTARY ENGINE—R. Hewson, S. F.
533,466.—CUTTER GUIDE—Howard & Scoggan, Oregon City, Ogn.
533,716.—FRUIT GRADER—Luce & Barngrover, Los Gatos, Cal.
533,823.—BOOTJACK—J. I. E. Nelson, Cedar Home, Wash.
533,666.—PAINT REMOVER—Pfaffle & North, S. F.
533,739.—DRENCER SPUD GEAR — W. B. Pless, Stockton, Cal.
533,740.—DRENCER—W. B. Pless, Stockton, Cal
533,741.—DRENCER HOSE GUARD—W. B. Pless, Stockton, Cal.
533,667.—FIRE ESCAPE—H. F. & L. Pokorny, Seattle, Wash.
533,669.—HOISTING APPARATUS—L. Rosenfeld, S. F.
533,610.—ELECTRIC RAILWAY—A. Rosenholz, S. F.
533,687.—BARREL SUPPORT—R. Walker, Oakland, Cal.
533,768.—HORSE POWER—E. J. Wood, Beckwith, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Bullion M Co, Nev	44	10c	Jan 26, Mar 21	R R Grayson, 331 Pine
Confidence S M Co, Nev	25	30c	Jan 9, Feb 13, Mar 6	A S Groth, 414 California
Crescent M Co, Cal	1	10c	Jan 15, Feb 16, Mar 11	A K Durbrow, 309 Montgomery
Golden Eagle M Co, Nev	1	15c	Jan 8, Feb 28, Mar 4	E B Holmes, 309 Montgomery
Gould & Curry S M Co, Nev	75	15c	Jan 17, Feb 19, Mar 12	A K Durbrow, 309 Montgomery
Inyo Marble Co, Cal	26	10c	Jan 21, Mar 6, April 5	W W Sargeant, Mills Building
Julia Con M Co, Nev	26	5c	Feb 13, Mar 20, Apr 10	J Stadtfeld, Jr., 309 Montgomery
Justice M Co, Nev	58	10c	Feb 9, Mar 14, Apr 3	R E Kelly 309 Mootgomery
Reed M & M Co, Nev	1	2c	Dec 31, Feb 11, April 3	John H Isham, room 33, Mills Bldg.
Sierra Nevada S M Co, Nev	108	25c	Jan 16, Feb 20, Mar 11	E L Parker, 309 Montgomery
Standard Gravel Co, Cal	1	12c	Jan 25, Mar 4, Mar 22	W H Schmidt, 207 East
Yellow Jacket M Co, Nev	58	25c	Dec 10, Jan 10, Feb 20	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Standard Con M Co	J W Pew, 310 Pine	Feb 18

San Francisco Stock Board Sales.

SAN FRANCISCO, Feb. 14, 1895.

9:30 A. M. SESSION.

100 Alta	35	200 Hale & Norcross	82
1100	33	100	81
100	32	300 Occidental	06
100 Andes	27	100 Opbir	1 45
100 Belcher	39	100 Potosi	51
50 Bodie	91	500	52
25 C. C. V	2 80	100 Savage	40
100 Chollar	49	50 Seg Belcher	05
	48	100 Union	45
	50	400 Yellow Jacket	45
100 Gould & Curry	28		

SECOND SESSION—2: 30 P. M.

50 Best & Belcher	72	600 Ophir	1 40
100	71	1100 Occidental	05
400 Bullion	10	400 Overman	14
500 Con Cal & Va	2 70	100 Savage	37
1000 Chollar	45	400 Sierra Nevada	32
200 G & C	27	200 Seg Belcher	05
100 Hale & Norcross	78	100 Union	43
300 Justice	09	300 Yellow Jacket	40
400	08		

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CARAMEL BOX PARTITION AND MACHINE.—William E. Henry, San Francisco, Cal. No. 533,645. Dated Feb. 5, 1895. The object of this invention is to provide a movable partition which is especially adapted to be employed in boxes in which caramels are sold and shipped. These boxes are made of pastehoard, or other suitable material, and each individual rectangular caramel is wrapped in a thin waxed paper to prevent their sticking to the sides of the box. In my invention, partitions are made for these boxes consisting of single strips of metal formed into longitudinal strips with integral transversely projecting arms upon opposite sides. To make these strips I employ a machine, cousisting of blocks separated from each other to form a narrow channel for the reception of a strip of metal and levers fulcrumed at opposite sides with bars connected therewith adapted to slide in slots or guides at right angles to the strip of metal, so that hy moving the levers the strips are folded into the shape desired to form the partitions.

ADJUSTABLE BARREL SUPPORT. — Robert Walker, Oakland, Cal., assignor of one-half to Jacob Kornahrens. No. 533,687. Dated Feb. 5, 1895. The object of this invention is to provide a support for barrels from which the contents are heing drawn whereby the harrel is gradually tilted as the contents are reduced, and brought into position to discharge the whole of the contents without agitating or shaking. It consists of a stationary support having segmental depressions upon opposite sides to receive and support the keg or harrel, and a spring-actuated arm having one fixed end, and the other end inclined upwardly with a segment fixed to it and adapted to fit the end of the keg or barrel, together with a rod or har with notches so that the spring may he drawn down hy means of this bar and the notches engage a suitable catch to hold it down until the harrel is in place. After this the notched har is released, and the spring acting against the upper end of the harrel, will gradually raise it as the contents decrease, so that the liquid can he drawn from the spigot at the other end.

ROTARY ENGINE. — Robert Hewson, San Francisco, Cal. No. 533,646. Dated Feb. 5, 1895. This invention consists of a wheel with a series of concentric annular chambers or huckets into which the propelling medium is admitted under pressure and couducted successively from one series of chambers to the next, operating expansively from each chamher to the following one. The wheel is mounted upon a shaft and adapted to rotate within a closed casing. It has two or more series of concentrically arranged huckets, open at one side only. This side moves in contact with a flat disk or diaphragm, which forms a constant wall for the open side of the huckets. A steam chamher is located upon the opposite side of the diaphragm in line with the outer row of buckets, and passages are made through which steam is delivered against the front wall of the huckets, to impel the wheel. Slotted openings are made diagonally through the disk or diaphragm opening from the steam chambers into the chamher where the wheel rotates. The arraugement of these passages is such that the steam is exhausted from each exterior hucket into the next interior steam chamber, and thence into the adjacent series of huckets, so as to act expansively in each case, the steam heing finally allowed to escape through an exhaust passage.

CAN OPENER.—James Gould Jr., San Francisco. No. 533,642. Dated Feb. 5, 1895. This invention relates to a device for opening cans. It consists of a shank having an attachment for the application of power, a flattened hook at the opposite end, formed with a sharpened convex outer curvature, a sharpened concaved curvature on the inner side, and an expanded or thickened point which is adapted to engage the inner wall of the can to serve as a stop and prevent the hook from heing drawn out while cutting. The convex outer edge or point is first forced through the metal so as to hring the hook portion inside; then, by pulling upon the hook, the inner edge cuts the tin in the line in which it is drawn until the can is properly opened.

Bucyrus Steam Shovel and Dredge Co.

SOUTH MILWAUKEE, WIS., Jan. 28, 1895.

To Whom It May Concern:—The undersigned have to-day heen appointed receivers of the Bucyrus Steam Shovel and Dredge Co., and, as such, have taken possession of all property, assets and husiness of the company. You are hereby notified that all payments should be made to us.

Under the orders of the court, *the business of the company will be prosecuted as usual.* Existing contracts will he executed, unless notice to the contrary shall he given, and orders for new machinery, repairs, supplies, etc., will he received on behalf of the receivers and promptly attended to.

All supplies and material which may come in subsequent to this date will he for account of the receivers. Soliciting your continued patronage, we are very respectfully yours,

JOHN S. GEORGE,
HOWARD P. ELLS,
Receivers.

The ahove is self-explanatory. The business continues without interruption, there being no check nor delay in the filling of orders, etc.

Assessment Notices.

GOULD & CURRY SILVER MINING COMPANY—Location of principal place of business, San Francisco, Cal.; location of works, Virginia, Storey county, Nev.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 17th day of January, 1895, an assessment (No. 75) of fifteen cents (15c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 19th day of February, 1895, will he delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the 12th day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia district, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 21st day of January, 1895, an assessment, (No. 44) of 10 cents per share was said on THURSDAY, the 21st day of March, 1895. levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 21, No. 331 Pine Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of February, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office, Room 21, No. 331 Pine street, San Francisco, California.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California; location of works, Inyo, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 21st day of January, 1895, an assessment (No. 26) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 13, third floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 5th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. W. SARGEANT, Secretary.

Office—Room 13, third floor, Mills Building, San Francisco, California.

DUMBARTON LAND AND IMPROVEMENT COMPANY.—Location of principal place of business, San Francisco, California. Location of works, in the counties of Alameda and Santa Clara, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 22d day of January, 1895, an assessment (No. 7) of 12½ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 214 Pine street, room 55, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on THURSDAY, the 21st day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JABEZ HOWES, Secretary.

Office, Room 55, 214 Pine Street, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from W. Thomas et al., in the Central Hill Mine, Douglas Flat, Calaveras Co., Cal., to impound tailings behind stone dams in ravines; from Giovanni Rossi, in the Kate Gray Mine, near Volcano, Amador Co., Cal., to impound tailings behind log and brush dams below mine; from J. E. Newsom, in the Shealor Mine, near Volcano, Amador Co., Cal., to impound tailings behind log, rock and brush dam in Sutter Creek; from Giani Demartini et al., in the Rail Road Hill Gravel Mine, near Fourth Crossing, Calaveras Co., Cal., to impound tailings behind a dam on flat ground; and from James Slater, in his mine near Brownsville, Yuba Co., Cal., to impound tailings behind York Mining Co.'s dam, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Feb. 25th, 1895, at 1:30 P. M.

Report on the Con. Cal. & Va.

In a recent report to the directors of the Consolidated California & Virginia mine, E. S. Spring says:

As you were good enough to listen to my account of the condition of the mine ascertained during an examination made by me on January 26th and 27th, I pointed out at your meeting the exact situation of the mine as it appeared to me, which was this: That the reserves of good ore contained in the body which we have been working in for the last eight months had been greatly diminished and there remained very little rich ore, although there is much of what we would call fair grade.

I would say that the policy of economy which has ever been adopted by this company has been carried out too strictly to the letter in this case, and our very efficient superintendent, Mr. Lyman, in wishing to save every dollar for us he could, has endeavored to do all his prospecting in ore. This has been a very commendable policy on his part, for in running drifts, sinking winzes and making other openings he has made the work pay for itself, besides earning a profit for the company; but by adhering too closely to this policy he has finally reached the limit of the pay ore in nearly all directions. It is very fortunate that we have at the present time a very large surplus, amounting to about $137,000, in our treasury, and it is fortunate besides that we can immediately start out with a large proportion of this money to bring our mine into a more prosperous condition.

Now, I would recommend to the board, leaving always to the discretion of our very efficient superintendent to use his best judgment in carrying out the plan, that a more energetic prospecting of the ground out and around various floors of stopes be inaugurated. The body of ore upon which we have subsisted is a footwall body of ore; that is, it lies immediately upon the west wall of the Comstock lode in the Consolidated California and Virginia mine. I think the footwall should be our guide in explorations, and I believe that to the north and the south of where we have been stoping ore there are other ore bodies of equal size and richness. I therefore suggest as a quick, easy and economical means of solving the problem that six prospecting drifts be started in the mine, two of them north and south from the bottom of the winze on the 1750-foot level, two of them north and south from the present workings on the 1700-foot level, and two of them north and south from one of the floors above the 1650-foot level, which Superintendent Lyman may deem to be the best point and that these drifts be run along the footwall, always keeping it in sight, and these openings all be carried north and south as far as possible, and, at proper intervals, as Mr. Lyman may deem best, east crosscuts be started therefrom on the several levels and should any indications of a favorable character be encountered, that they be prospected in the directions where they look the most promising.

I also recommend to the board that Superintendent Lyman be permitted to increase the working force of the mine to any reasonable extent that he may think proper in carrying out this work. It may be possible for him to accomplish this with his present force, but to facilitate the operations which I have outlined he is to be permitted to take on the number of men that he may require, in addition to the present force.

It is my firm belief from a most careful examination of the mine that the plan which I have recommended to you will, within a reasonable time, bring the property into another state of prosperity. The Consolidated California and Virginia mine is a prolific piece of mining property; it has been given up as "petered out" by superintendents and managers many times, but as the work of exploration has continued the mine has repeatedly come into bonanza again. I have no fear but that with a more energetic prospecting of the mine it can be brought into another state of prosperity.

I would also suggest that when any ore body is discovered of the same importance as that in which we have been working the prospecting of the mine be kept well in advance of the ore extraction. The mine deserves a great deal of development work. The ore bodies occur in kidneys in the vein, and it is well to keep one or two of them in sight.

Professional Cards.

A. H. RICKETTS, Attorney-at-Law,
Mining Patents and matters before the Land Department a Specialty.
Crocker Building, Rooms 201, 202 and 203, San Francisco.

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Mining Operator,
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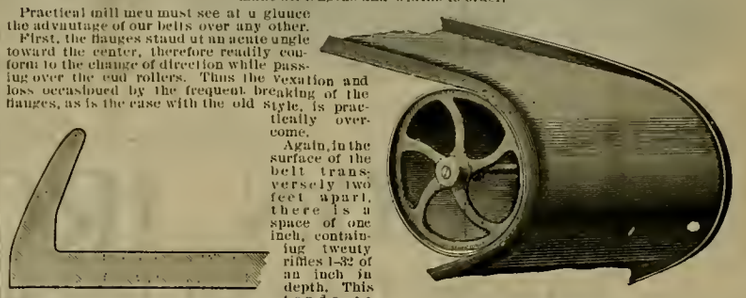
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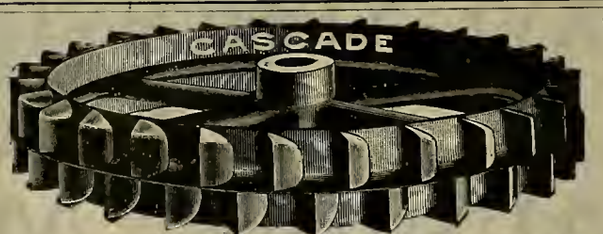
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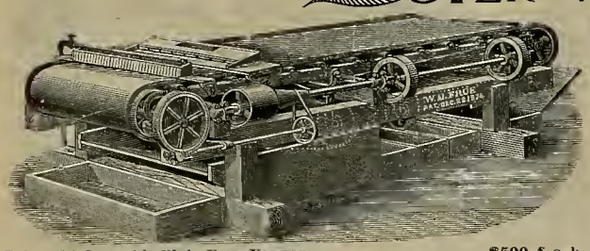

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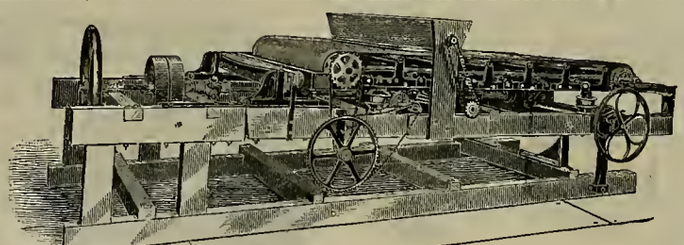

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Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 8. SAN FRANCISCO, SATURDAY, FEBRUARY 23, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

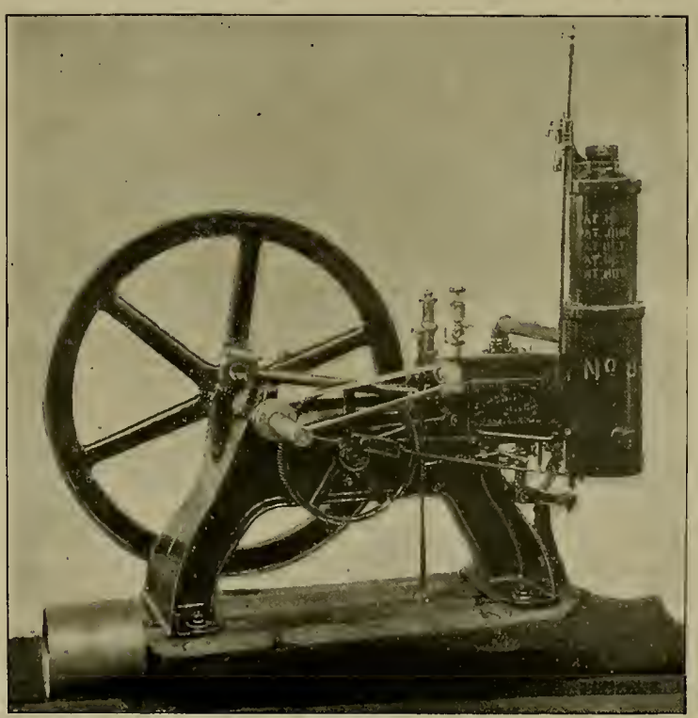
A Clear Title.

The United States mining laws recognize three distinct titles: Title in fee simple, title by possession, complete equitable title. The first vests in the grantee an indefeasible title; the second is only in the nature of an easement. The first being an absolnte grant by purchase and patent without condition is not defeasible; the second is a mere right of possession and enjoyment of profits without purchase, and may at any time be abrogated by failure of the occupier to comply with the requirements necessary to hold it. The equitable title accrues immediately upon pnrchase, for the entry entitles the purchaser to a patent, and the right to a patent once vested is equivalent to one actually issued. Sec. 2324 of the Revised Statntes refers solely to titles by right of possession, and in no way conflicts with title acquired by purchase. The latter is the lowest grade of title known to the mining laws: the next is the equitable title, which accrues upou purchase and entry; the third and final grade is the fee simple, acquired by patent, evidencing the legal title and merging it iu both the possessory and eqnitable titles. Under the pre-emption laws it may occur that the legal title may be in one person and a superior eqnity in another; this cannot exist nnder the operatiou of the mining laws, as all legal and equitable adverse claims and titles must be presented and passed on before the patent issnes, or be considered lapsed and abandoned.

The above is intended to emphasize a trite fact—that a mining claim shonld be patented. There is a variety of reasons, foremost among them being that if it is desired to sell the claim, the possession of a patent is a great deal. If the owner of tbe elaim can say "I have a United States patent," he is in vastly better position before the prospective purchasers than if he cannot. Many a good opportnnity to sell a good mine has been lost through inability to produce a Government patent. That is always a guarantee of title; there is no going back of it or behind it. Before it can be had, certain forms mnst be observed and everything proved up beyond a possibility of legal entanglement. None know this better than the men who have to pass npon the pnrchase, and when a man does buy an nnpatented mine, it is very often with the proviso that a good part of the purchase money shall be withheld nntil a patent to the property can be scenred. That is only fair, for, if there be any flaw or hitch, it will be developed during the patent-application proceedings, althongh undistnrbed and uninterrnpted possession may have been enjoyed for years. Purchasers mnst protect themselves; and the best way for sellers to do likewise is to secnre a patent. In general, if a claim is worth working or selling, it is worth patenting. A good mine with a poor title is not so readily available as a mine not so good, bnt with a clear title. Negligence, delay, carelessness, shonld not occasiou lapse of self-interest, and in the general demaud for good gold properties throughout the State it is well for every claim owner to bear these facts in mind.

The Best Gas Engine.

Herewith is depicted the Daniel Best gas engine with generator attached. This generator is part of the engine. It is the npright cylinder and connected by pipes to the main cylinder of the engine. By utilizing the heat from the exhaust is generated gas from a class of cheap, heavy oils, which could not otherwise be nsed in gas engines. From oils thus used is secnred an over-product in the shape of a lubricating oil, the valne of which—whatever it may be—is of eourse deducted from the first cost of the crude oil, which is explained in the table below of a test made recently of a Best five H. P. gas engine based upon a ten-hour run.



THE BEST GAS ENGINE.

This table also shows the test made on other oils as well as coal or city gas. By reference to this table, it will be seen the economical discrimination in favor of gas engines using crnde oils. As crude oil will not explode from any cause except when set on fire like any ordinary oil, there is further merit from an insurance standpoint. It is claimed that even if the over-prodncts conld not be disposed of, it is still one-half cheaper to nse crude oil than gasoline.

Following is a test of one of these five H. P. gas engines, rnnning ten honrs on different oils, using the generator, the results showing a reduction in the cost of operating a gas engine to a minimnm:

Coal or city gas, 1000 feet	$2 00
Gasoline (74 test), 8¾ gallons, at 14c	1 23
Domestic coal oil, 7½ gallons, at 10c	75
Santa Paula crude oil (alphaltum base), 16 gallons, at 3c	48
From this there is an overproduct of seven gallons, which is in the shape of asphaltum, valued at 3c	21
Crude petroleum (paraffine base), 13 gallons, at 5c	65
From this there is an overproduct of three gallons of good lubricating oil, which we consider equal to any we have ever used, but we will estimate its value conservatively at 20c	60

Acconding to these figures furnished by Mr. Best, the operation of these engines with erude oils reduces the cost to a minimum—crude petroleum at $\frac{1}{10}$c per honr per horse power, Santa Panla oil about ½c per hour per horse power, domestic coal oil 1½c per hour per horse power, and on gasoline 2½c per hour per horse power.

"What does it cost to produce an ounce of silver" is a question that has again been started going the rounds. An English authority gives the indefinite data of "over four shillings an ounce." That, certainly, appears to be sufficiently obscure to pass nncontradicted. Still, in extenuation of that vague transatlantic estimate, it must be confessed that an exact answer to the question is difficult to give, as so many factors enter into the eqnation, some of them extremely difficult to determine. Where silver and silver alone is prodnced; where the ore yields a large percentage of gold, where "the lead pays for the mining," there must be large allowances for the necessary difference in cost of production. Then, too, is to be taken iuto consideration the amount of necessary dead work, the investment in machinery, varying cost of snndries, all of which enter iuto the question. The fact that so many straight silver propositions have shut down emphasizes that at present qnotations they have ceased to pay. This is probably the most practical evidence of cost that can be fnrnished. Where silver has been merely a "by-product" its cost has been reckoned as low as five cents an onnce. Where it has been produced from an assessed, non-dividend paying mine it has been shown to cost over $2.25 an ounce. In the old days on that part of the Comstock working in bonanza an ounce of fine silver was reckoned to cost thirty-eight cents; the mines working in barrasca made the silver they yielded cost $2 an onnce. It is believed that during '91 the average cost of an onnce of silver mined in this conntry was abont eighty-four cents. The improvement in silver processes has not kept pace with that in gold methods. Taken all throngh, it is probable that anything short of eighty-five cents an onnce for fine silver makes its mining, in general, an unprofitable pnrsuit.

The taxation of mining claims in Colorado is being discussed. It is in order to observe that nnpatented mining claims are now "taxed" annually $100, except when that law is suspended. The tax does not go to the government, but the principle is virtually the same.

The Siberian newspapers announce the discovery of rich and extensive gold fields along the upper reaches of the rivers Neya, Nina and Uibat, in the province of Yeniseisk, East Siberia.

The war over railroad transportatiun rates from the coal fields to Chicago is the means of landing soft coal in that city at a lower cost than ever before—$2 per ton.

"Everything is cheaper these times," says a city contemporary. How about gold?

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J. F. HALLORAN.....General Manager

San Francisco, February 23, 1895.

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REGARDING the proposed suspension of assessment for '95, the general consensus of the mining community is against it. It would be a mistake to repeat the suspension act of '93 and '94.

THE Colorado smelting combine has gone to pieces, and hereafter each smelter will act independently, the constant contest between the ore seller and ore buyer assuming a phase more favorable to the former.

REFERENCE was made last week to the injunction bill in the State Legislature, which gave hydraulic miners the same standing in law enjoyed by other people in other pursuits—no more, no less. It passed the Senate, was beaten in the Assembly, but was reconsidered and passed to second reading; hence will now in all probability become a law. The success of this measure is largely due to State Senator Ford and Assemblyman Thomas.

A MONTANA CONGRESSMAN has discovered an unrepealed law passed in '57, ordaining that certain denominations of Mexican silver money be received at the United States Treasury at fixed valuations, and hopes to make it possible by legislation to send silver to Mexico for coinage, bring it back here and get the value for it under the law at the United States Treasury, thus indirectly securing free coinage of silver. The validity of the law is beyond dispute, but the official cessation of Mexican mintage of the coins designated in the statute, will render nugatory the attempt. The dies for those coins were destroyed ten years ago.

RECIPROCITY with Mexico is of present importance to the United States. The productions of the country are different. Mexico is a country of raw material; ours is a manufacturing country. Mexico has 15,000,000 people engaged in silver mining, sugar growing, coffee growing, etc., who have money to pay for improved mining and other machinery, and manufactured articles of every kind. Mexico is not naturally a manufacturing country, but it is a natural market for the United States. It must be cultivated: the needs, tastes, even whims of the people should be catered to; what is worth having is worth asking. And because of this, the approaching Mexican Exposition is of considerable commercial importance to this city and State. There is a good feeling between the two countries; our southern neighbor is rich and prosperous, and anything and everything that can create and continue commercial relations and good will should be put into operation.

ANOTHER detachment of the California party that left here last May for the South African mines has returned. They tell the same story: poverty, extortion, very low wages, scarcity of work, inferiority of the country as compared with California for mining and woeful privation of many there. It is the universal verdict of all we have seen who have been there that, unless a man has assurance of a good position at a very large salary, he is unwise to seriously contemplate going there. Of course, brains are never at a discount anywhere, and a clever man will ultimately get a foothold; but the same expenditure of skill, knowledge and energy that would admit of his making a meager living there would give him a far better mode of existence in California—the most favored gold mining region on the globe. The PRESS early received positive evidence regarding the undesirability of indiscriminate migration to the South African gold fields, and has reiterated the information. A multitude of interior papers have steadily advertised the cheap passage rates announced by a shipping firm in this city; and this, with the glamour cast over the fact that a few first-class California miners who had considerable State reputation have got princely salaries there, has naturally acted as an incentive to many to try their luck there too. But the facts are as so often stated in these columns, and time tends more and more to confirm them.

How opinions change with changing circumstances is well illustrated in the case of certain editorial writers in Colorado. Eighteen months ago they wept over the silver depreciation and declared the bottom had fallen out of that State. According to them one of the greatest of our American commonwealths was doomed to depletion, and nothing was left but to mourn over the grandeur of the past. But the sturdy miners of the Centennial State uncovered its golden treasure, and, finding no profit in silver mining, developed the gold mining industry. Now, the same men who talked so dolefully over the silver outlook have gone clear over on the other side, and say silver is no good anyway; that gold is the thing, and that Colorado would be a loser by the free coinage of silver. Of course, the truth lies between. Nothing but the indomitable spirit characteristic of the miner could have redeemed Colorado from the depression of '93, but because the gold yield of that State so far exceeds their anticipation does not justify Colorado writers in decrying silver. Apart from other considerations there is a requisite consistency in expressed thought that fails to sanction such complete change in opinion. But had any writer outside of the State in '93 said half as much about the relative value of gold and silver mines as those alluded to are saying now, how he would have been held up as an enemy of mankind in general, and the foe of silver in particular. The State of Colorado is to be congratulated on her happy solution of the industrial problem more than upon the vacillating policy of some of her citizens, who exemplify by their published statements the difference between those who work and those who only talk.

As To California.

With all the talk about the sales of mines to Eastern syndicates, who knows of any considerable sum of money actually paid by the Eastern men last year? We venture to say the total paid for Western mines—not stocks—did not exceed a quarter million dollars. The present year promises to do much better. It starts off with one cash sale we know is made—the Iron Mountain group of California. Among others who were interested in the sale, were N. F. Cleary, formerly of Leadville, and Hugh McDonnell, of Montana, who is well known in Denver. A good, nice part of the purchase price of $300,000 was paid in cash last Thursday. Boston and New York parties were the purchasers.—*Denver Mining Industry and Tradesman*, Feb. 14.

Eastern men put a good deal of money into California gold mines last year. The excerpt above is not in accord with the facts. Among the large sales of California gold mines reported made in '94 to "Eastern men", may be cited the Somerville Con. Gold mines, consisting of the Lena, Bellflower, Young America, Seminole, George Worcester and Buckeye, in Tuolumne Co., sold to D. H. Cole, of New York City, for $1,000,000; the Burton group, on the Robinson Ferry road, one mile north of Tuttletown, Tuolumne Co., sold to Montreal men for $140,000; the Mountain View in Fresno Co., sold by A. Wambold to Chicago men (Chicago is reckoned "East" out here.) for $40,000; the Gold Ridge Consolidated, comprising four quartz mines, and 1600 acres hydraulic ground to L. Barstow and W. Pumfort of New York, for $35,000, the Chapparall mines near Angels Camp, Calaveras Co., sold to Mathers & Jackson of New York, for $400,000.

Besides these there were numerous other sales, principally in central and northern California, of mining properties, drift, placer and quartz, involving sums from $5,000 to $2[illegible],000, wherein a large part of the purchase money was furnished by Eastern men; the Manhattan and Chemical banks of New York being the intermediary in one $450,000 transaction in Sierra Co. Besides "Eastern men", the past year saw considerable capital from Colorado, Montana and Utah judiciously invested in California gold mines, yielding and to yield a handsome return. British and French capital to the extent of at least a million dollars also found investment in this State in gold mines in '94.

The Jones Bill.

The Jones bill is manifestly unsatisfactory to those who favor the coinage of silver at the ratio of 16 to 1. It provides that holders of silver may have it coined into standard silver dollars, receiving its equivalent therefor, measured by the metal's market price in New York at the time of its deposit in the mint. At 60 cents an ounce that would mean a ratio of about 34 to 1, which from a free coinage of silver point of view is absurd.

In discussing the question a usually astute Utah contemporary declares that the passage of the law would immediately send the price of silver up to $1.29 per ounce. "'Tis a consummation devoutly to be wished." But will it? Experience says "No." The gentlemen who, when silver was being bought and coined to the extent of 54,000,000 ounces a year, were able to hammer the prices down from $1.18 to 81 cents an ounce, would be able to make or mar the market at their selfish pleasure under the Jones bill. As a constant and consistent advocate of silver the PRESS believes that the Jones bill would not open an American silver mine nor aid in solving the present financial difficulty. Pattering, subterfuge or evasion has about worn out the patience of the country. There should be no half-way measures. It must and will come to free coinage of silver at the ratio of sixteen to one, and nothing else will satisfy the country or afford necessary relief.

Well, Well!

Although California is the oldest mining camp in the west, it is way behind the times in improved methods of mining and milling.—*Deadwood Pioneer*, Feb. 15.

The author of the above omits to state whether he knows the assertion to be a fact, or whether it is just his own private opinion. If he assumes it is a fact, he will please establish proof. If it be simply his belief, while he has, in general, the right to be wrong, yet in this case he abuses the privilege. As the pioneer in gold mining and milling methods, California has originated about all the successful principles in actual practice; the miners of this State are in all respects fully up to and in several respects ahead in modes and methods of mining and milling gold ore; the latest, up-to-date processes are in use all over the State, many of them California productions, and when a competent man is needed in any part of the world to superintend or successfully manage large mining enterprises it is to California that the owners or directors turn—and they usually find the talent, skill, experience and ability needed. For these men they pay from $5000 to $60,000 a year. "They come high, but they must have 'em."

The South Dakota scribe who got off the above squib might be pardoned for his ignorance, but his stupidity cannot be condoned.

THE Committee on Mineral Lands, appointed at the last session of the California Miners' Association, report very satisfactory progress. The famous or infamous "clear list 54," covering nearly 134,000 acres of valuable California land, and once certified to as correct by the Government examiners, is to be published, and miners will have a chance to file protests. This list embraces lands in Nevada, Placer and El Dorado counties, and is of interest to every miner in those counties. List 22 in the Los Angeles district and list 25 in the Redding and Marysville land district have also been withdrawn, and there is a general suspension of Government haste in patenting lands to the railroad companies. The Hartman bill leaves California out, but a bill forfeiting all lands granted to bond-aided railroads has been reported favorably by the committee to whom it was referred, and approved by the Secretary of the Interior. As usual, Senator Stewart, of Nevada, is fighting the effort to secure justice for the miners and trying to aid the railroad side of the case.

Concentrates.

GOLD commands 3⅛ of 1 % premium.

THE Morning Star Mining Co. has declared a $4 dividend.

THE Mammoth (Arizona) mill and mine start up this week.

COLEMAN & TURNEY have bought the Angel's mine, at Angels.

THE PORTLAND G. M. Co., of Victor, Colorado, has declared a $30,000 dividend.

THERE are upwards of 400 men, including teamsters and ruwhiders, working in the Slocan.

THE number of men employed in the Little Johnny, Colorado, mine is 220, and the output 220 tons daily.

RYAN BROS., of Cheyenne, have bought a half interest in the Lost Horseshoe mine, near Indio, Cal.

THE only mine now in operation at Mullan, Idaho, is the Grouse, on which but three men are employed.

THE mill on the Empire mine near Copperopolis has been completed, and in a short time will be started up.

DURING January twenty-seven mining companies in the Rocky Mountain region paid $788,000 in dividends.

THE *Echo* wants it understood that Angel's Camp, and not "Angels," is the name of the town where it is published.

T. J. REGUA has leased the borax works in Saline valley, Nevada, abandoned by Messrs. Stoutenborough & Milner.

THE Anaconda company will begin next month the erection of a refinery, etc., at Great Falls, Montana, to cost $2,000,000.

ACCORDING to the Leavenworth, Wash., *Journal*, "considerable platinum" is washed in the gold gravel thereabouts.

EIGHTEEN men are reported making good wages on their own account at Montgomery, Ivanpah district, San Bernardino Co.

ALUMINUM has been discovered again, this time in Utah, "in volcanic slag," which is a decided metallurgical phenomenon.

AT the new gold camp six miles from El Dorado canyon, Nevada, Flood and Mackay have thirty men developing their property. A mill will shortly be built.

FROM Vanderbilt, Cal., comes a description of a unique stamp mill, built by Mr. Brown, entirely of wood except bosses and shoes, and operated by horse power.

DIVIDEND No. 1 of the War Eagle Mining Company has been declared payable at the offices of the company in Spokane, Wash. Amount $30,000; six cents per share.

EVERY conceivable method of placer work, from the rocker and snipe to the Kent washer and sluice, is being utilized in getting gold from the bars in Colorado canyon.

THE Old Glory mill at Oro Blanco, Arizona, is said to be taking $100 off from the plates every twelve hours, and $100 in concentrates, making a total daily yield of $400.

THE Golden Valley Mining Company has been incorporated at Portland, Maine, for the purpose of engaging in gold mining in the Ures district in Sonora. The capital is $100,000.

THE Green Mountain mine, in the Murchie ravine, Nevada Co., has been bonded by J. W. Straw, late foreman of the English Mountain mine, who is backed by a Colorado company.

FOUR HUNDRED THOUSAND DOLLARS is the announced price paid for the Blair mine to J. J. & Wm. Smadeke at Smith's Flat, near Angels—$30,000 down, and the remainder later on.

IT is said that the Tacoma smelter is now guaranteeing mine owners that payments for ore will be made in gold, provided the yellow metal sells at a premium before the end of 1895.

RAIN has evidently fallen in Arizona. The *Prospector* says: "This is a splendid year for ducks and placer miners; placer gold is coming in from every quarter and ducks from every valley."

THE Prince mine, in the heart of the town of Altaville, Cal., shows a four and a half foot vein, and is reported to yield well in free gold. No accurate value of the rock has yet been secured.

A BILL has been introduced in the Montana State Senate providing for the establishment of a uniform system of signals for use in all mines where the shaft is seventy-five feet or more deep.

THE Somerfield mine, owned by C. O. Barker of Banning and Fish & Son of San Bernardino, near the old Dos Palmos stage line station, San Bernardino Co., has been bonded for $125,000.

W. C. WYNKOOP of Denver, last week closed a sale on which he had been engaged a year, of mining property in Calico district, San Bernardino county, for $75,000. Boston men are the purchasers.

EXTENSIVE sulphur mines situated in Lower California have been located by Anthony Godbe, the claims having been accepted by the proper department of mines of the Secretary of the Interior.

COLORADO SPRINGS reports that the Mollie Gibson company will pass its February dividend. The mine is only producing 40-ounce ore at this time, and expenses of the past month consumed all the output.

THE Nevada *Sentinel* says "there is not a man in Eureka county who has an income of $4,000 a year." The income tax does not affect the people of the Base Range. The price of silver is too low for that.

THE *Echo* hears that the Sawyer claim, situated on the Dead Horse lead, Angel's Camp, has been bonded by the Utica Mining Co. for $34,000, and that a deed will issue for the property in June next.

AT SONORA last Monday, in the Golden Gate mine suit, the ninety-one special issues were all decided by a jury in favor of E. C. Loftus, the plaintiff, thus deciding that the mine was not a corporation but a copartnership concern.

A TACOMA dispatch says: "If all indications are not at fault the famous Lost Rocker mine of Alaska has been found." All famous "lost" mines in all localities are always "found" when the snow lies the deepest, but the find rarely materializes later in the year.

THE Seattle *Press-Times* says: "Already there are many more men in Juneau and on Douglas Island, immediately opposite, than can be given employment at the Treadwell, Boston or Nowell mines, vacancies in any of the three companies rarely occurring among the white operatives. This is due to the fact that all through Alaska, at both mines and canneries, the "siwashes"—native Indians—are employed to do the rough and more laborious work, white men only being employed when skill or technical knowledge is necessary."

AS a matter of urgent necessity, a bill was introduced in the House last Thursday appropriating $20,000 to pay the expenses of the United States Debris Commission. It is possible that this session it will be appended to the civil appropriation bill, and so go through.

WITH surprise not unmixed with doubt it is read in the Yuma *Prospector* that the heirs of the late Senator Fair have sent to Yuma a detective to hunt up information detrimental to their father's character during his visits there in the fall of 1892 and winter of 1893.

FOR the month ending December 1st, '94, the gold yield of Western Australia was as follows: Coolgardie, 14,633 ounces; Murchison, 7,361 ounces; Yilgarn, 1,319 ounces; Kimberley, 194 ounces; Dundas, 100 ounces; Pilbarra, 20 ounces; total, 23,628 ounces; value, £89,787.

THE American company which recently bought the Santo Domingo gold placers, in the Magdalena district of Sonora, have already spent $100,000 in road making, machinery purchases and other preliminary work. The ground to be exploited comprises 200 claims of a hectare each.

THE Crescent Gold Mining Company has filed articles of incorporation with the Montana Secretary of State. The capital stock is $250,000. The incorporators are R. B. Henderson, J. S. Sherburn and W. E. Horton. The company will operate the Crescent mine, in Park district, Jefferson county.

IT is no uncommon thing, says the *Echo*, to hear of parties receiving a patent for a homestead and then in a short time therenfter developing a mine on the land, or leasing a portion of it for mining purposes. There are a few such cases in Calaveras county, and, probably, in Tuolumne and Amador.

A. HANAUER has nearly completed his annual report for the government of the mineral output of Utah for 1894. The report shows, contrary to all prophecies, that the silver production did not increase during the year, but was substantially the same as that of 1893. The gold production was heavily increased.

THE Tucson, Arizona, School of Mines is about to put in a car-load of mining machinery, including a crusher for fine work; a 5-stamp mill, with 600-pound stamps, feeder, plates and all appurtenances; a 3-stamp mill, with 250-pound stamps, for treating small lots; a sample grinder and automatic sampler.

CHICAGO firms have offered to provide the capital necessary to bring water on to the gold bearing benches of the Anglo-American gold mine claim on the Similkameen river, provide all the machinery and put the enterprise on a sound footing. The Anglo-American company are considering the proposition and conditions.

THE War Eagle mine, Trail Creek, cleared $25,000 last month, after paying all expenses, including new buildings, etc. The War Eagle people were inconvenienced on account of there being no custom officer in Rossland, so they made application for one, and guaranteed his pay. Already the office is self-sustaining.

CRITICISING a recent article about South African mines, a Colorado subscriber says that Mr. Webber, the superintendent of the Crown Reef would not exaggerate the value or amount of the ore therein, and that the ore in the Little Jonny will average $50 per ton, and stating that the way it is here spelled is the correct orthography.

IT is reported that the London & Cripple Creek Reduction Co. has been organized to build a smelter at Colorado City with a paid-up capital of $650,000, and that the company has secured an option on fifty-four acres adjoining Colorado City, including the iron furnace and glass works, the former of which is to be turned into a smelter.

AN Arizona miner is reported at work near the summit of Mt. Union, one of the highest mountains in that section, with a rocker taking out placer gold. Water from snow is to be had sufficient for rocker work there at this season of the year. It is an Arizona peculiarity that placer gold is as liable to be found on top of a mountain as in the bed of a creek.

FLATTERING REPORTS are being received from a new gold find on the line of the Atlantic and Pacific road, about three miles west of Ibex. The croppings were hauled to the Ibex mill, where it yielded $12 per ton. From these prospect holes they are now taking out ore that runs $60 in gold to the ton. The owners of the Ibex property are chiefly interested in the new find.

JOHN POPEVALE, a miner employed at the Rawhide mine, Tuolumne Co., last Tuesday fell from the skip at the 500-foot level, and was instantly killed. He and another were in the skip at the 400-foot level. One of them gave the engineer the wrong signal and he sent the skip into the sump. As he was signaled to hoist, the unfortunate man fell off, his head being crushed and his neck broken.

THE Washington State land officers have received a decision from the Commissioner of the General Land Office affirming the local officer's decision in favor of McBride in the famous contest case of the State of Washington against John G. McBride, involving a valuable school section in the city of Tacoma. McBride based a claim to the section on the alleged mineral character of the land, in which he has been sustained.

THE Juneau, Alaska, *Record* figures that the Treadwell stamps crush, each, 110 tons every twenty-four hours. They each weigh 850 pounds, and make ninety blows per minute. Were mechanism devised to make them strike 900 blows per minute they couldn't each work 110 tons daily. A stamp mill that crushes three and a half tons to the stamp every day is doing more than the average. Probably 110 tons per month is meant.

PUMPING the water out of the Oro Fino, Cal., mine, begun in December, has just been completed. The mine has been worked to a depth of somewhat more than 300 feet, and the work of pumping out has been a big job. There is a good-sized ledge exposed, and some of the rock is very rich. The first mill on this ledge was built in 1862. In 1866 the property was purchased by Virginia City parties, and was worked for several years with good results.

THE case of Silas F. King vs. the Amy and Silversmith Mining Company has been sent back to the district court of Silver county, Montana, on a remittur from the United States Supreme Court. The case was tried in the district court there two years ago, and a decision rendered in favor of the plaintiff. It was then appealed to the State Supreme Court with a like result, and from there to the United States Supreme Court, with the above outcome.

THE American Falls Canal and Power Company has incorporated at Boise, Idaho, capital stock $500,000, to build and operate a canal near American Falls, in Idaho, for mining, milling and agricultural purposes, to be sixty feet broad, and carry four feet of water, about fifty miles long. The preliminary surveys have been made, a practical route found, and the final location will be made at once, and the work of construction commenced as soon as the weather will permit.

GEORGE WEBBER, who since '88 has been superintending operations at the El Callado gold mine in south-eastern Venezuela, is off via this city for the South African gold fields. He says that when the Rothschilds bought the mine in '88 for $5,000,000, it had already yielded $18,000,000, and since then has produced $7,000,000, besides the millions that he says have been stolen by the Jamaican natives working in the mine. This gold mine, which, if all asserted be true, is the richest gold mine in the world, is considered to be about exhausted.

THE Colorado or Minas Prietas camp in Sonora, Mexico, is reported by F. A. Drake, to be one of the greatest gold camps in the world. He says that the camp has seven mills, running day and night. Some of the ore is exceedingly rich. The Yuqui miners had stored away a total of twenty-six pounds in the Colorado mine, which they were trying to bring to the surface. They were caught with it. The value of the ore was $60 a pound. The company are now said to be contemplating building a branch railroad to Torres, a distance of seventeen miles.

BANTA & WINK, Port Orford, Or., claim to have successfully solved the problem of separating the gold from magnetic black sand by means of a system of sluice boxes "saturated with a chemical crystal that attracts and holds the gold," the solution being "charged with a magnet invented by us, the crystals being repulsive to iron." They say: "We save 90 per cent of all gold in black sand or gravel, no matter how fine the gold may be." These are very sweeping claims, and, if substantiated, will be of surpassing importance to many who have long been baffled in attempts to successfully work black sand deposits.

The Idaho *Statesman's* Silver City correspondent mentions the fact that in one of the mines there the exhaust plan of ventilation has been adopted. This is the only method of ventilation where ventilation has to be produced by artificial processes. The old idea was to drive fresh air into the face to supply the men working there, but this resulted in filling the works with the smoke and gases. By the exhaust process the gases are drawn into pipes at the face and taken out of the mine, leaving nature to fill the vacuum with pure air. This method is particularly useful in running a long tunnel. Under the old method men were sickened by walking through the gases driven back from the face, but, with the gases and foul air taken away from the face and carried out through pipes, there is no part of the tunnel where the air is not perfectly pure. The wonder is that this mode of ventilation should not have been devised sooner than it was; and now that it is in use there is no excuse for continuation anywhere of the old man-killing method.

IN southern Oregon, where most of the mines of the State are located, the bill introduced by Representative Smith of Josephine, to change the mining laws of the State, is unpopular. It is claimed it would unnecessarily place many impediments in the way of the development of Oregon's placer mines and seriously injure that important industry. The impounding of tailings, which is required by the measure, is one of its specially obnoxious features. The miners say Representative Smith's bill will probably suit R. D. Hume and some farmers living along the streams in which the farmers run their tailings. Hume threatened to shut down mining in southern Oregon because the people objected to him capturing all the fish that wanted to go up the river. He said the miners were shoaling the mouth of Rogue river. The miners do not want any such bill, and it will be the beginning of endless litigation and the shutting down of gravel mines in Jackson and Josephine counties.

Personal.

H. B. MURRAY is back from a two years' trip through Mexico.

THOS. T. LANE has returned from this city to the Utica mine much improved in health.

MR. D. W. BALCH, formerly assayer in the United States Mint, is at Sydney, Australia.

Ex-Gov. WILLEY has sold his extensive mining interests in Idaho, and will locate in this State.

GEO. R. SMITH, former president of the Gold Hill, Nev., Miners' Union, is reported dying at Reno from miner's consumption.

RALPH NICHOLS denies the statement so generally circulated that he has been appointed superintendent of the De Lamar mines, Nevada.

THOS. COUCH, of the Boston and Montana Mining Co., and principal owner of the Merced Gold Mining Co. property, is visiting Coulterville, Cal.

W. H. JAMES, manager of the Omaha & Grant smelter, denies that his company has any intentions of erecting a smelting plant at Guaymas, Mexico, or Vancouver, Wash.

E. R. ARADIE, formerly superintendent of the North Star mine at Grass Valley, is now superintendent of a gold mine at Johannesburg, South Africa, at a salary of $10,000 a year.

MR. I. B. HAMMOND, of Portland, Or., is in the city. He has completed arrangements with the Fulton Engineering and Ship-Building Works to build his new five-stamp mill, which he is introducing.

J. R. DE LAMAR, the "Monte Cristo" of Idaho, is a native of Holland. He is sized up by a local newspaper as small in stature, with large features and red hair, and has been a sailor, a glue workman, a bartender and a butcher. As he is now a millionaire he has given up the other jobs.

Obituary.

WM. GWINN, SR., died recently at the Vacas silver mine, near Muleros, Mexico, where he had superintended affairs for the last eight years. He was a California pioneer, well and widely known, and built the telegraph lines in this State between Auburn and Grass Valley.

A Paternal Scheme.

SHALL THE GOVERNMENT OWN OUR RAILWAYS? By Eugene D. Mann. Pamphlet, 16 pp. Price, 20 cents. Town Topics Publishing Company, New York.

The author answers his own question in the affirmative, and after disposing of all objections to governmental ownership, although seeing some financial difficulties in the way of raising the six or seven billions cash which he fixes as the value of the $10,500,000,000 of railway securities, he elaborates the following plan for acquiring the nearly 180,000 miles of railway now in the United States:

Let all the railways, either voluntarily or by government compulsion, unite in a common trust, with the government, represented by a commission, as trustee. In order to effect this union upon an equitable basis, the President, the Speaker of the House of Representatives and a practical railway man to be chosen by these two shall act as a committee to select and name a "commission of appraisement." This commission shall consist of twenty-five members, chosen as follows: Five railway men, five bankers, five merchants, five lawyers and five expert accountants, each to be thoroughly representative of his class. They shall serve for the period of one year, in which time it is expected that they shall complete their work, at a salary of $25,000 each. Each member shall be entitled to one able clerical assistant, at a salary of $4000. This will cost for the year $725,000, and the government shall be reimbursed later on by the consolidated railways.

The commission shall divide itself, by lot, into five sections of five members each (one banker, one railway man, one lawyer, one merchant and one accountant to each section). It shall also divide the country into five sections, corresponding with the number and extent of railways. Then, again by lot, a section of the country shall be assigned to each section of the commission as its field of work.

An exhaustive examination of all railways shall thereupon be made, with the view of ascertaining their rightful value. The extent and condition of material property shall be carefully inventoried. Debts, funded and unfunded, as well as accumulated surplus and sinking funds, will be scheduled. Past business and future prospects will be fully taken into account, in order that their earning capacity may be justly estimated. All the elements that tend to determine or influence railways' assets, both present and prospective, shall be given consideration and proper weight.

It is reasonable to infer that in this manner the real selling value of a railway may, without prejudice to either seller or buyer, be arrived at. A comparison of this appraisement with the outstanding securities of each railway will, in due time, enable the commission to set a correct exchange value upon the latter.

The findings of this commission of appraisement shall be accepted as final by both the government and the railways. We will assume that the total valuation thus obtained will amount to $7,000,000,000. The government will then prepare and issue, as trustees, its certificates of future participation in a total of this amount. The owners of previous railway securities, according as the value of each has been fixed, will receive, in lieu thereof, these new certificates pro rata of their holdings. The character and denominations of these certificates will have been determined by the commission of appraisement. They shall be freely negotiable, being made to bearer, with a provision for registry if desired. This, it may be incidentally remarked, would doubtless put the larger share of them, sooner or later, into easy circulation and make them as available for currency as greenbacks, and with an equally sound and acceptable basis.

The government would assume no obligation of redemption other than the duty to, at any time, through its treasury and sub-treasuries, issue new certificates in place of old or mutilated ones. The knowledge that they represented such vast, permanent and profitable wealth, administered by an absolutely responsible trustee, would be all the guarantee the public would demand. The property would exist and be maintained forever; the trustee never dies, and the business and earnings would go on as long as the nation survives. Neither bonds or greenbacks present better credentials.

Having thus placed itself in possession of all railways, the government will proceed to operate them, as trustee for the certificate holders, upon a plan outlined in the following pages.

The net earnings, after providing for maintenance and repairs, shall, to the limit of five per cent upon the whole issue of certificates, be paid over semi-annually upon presentation as a dividend to the certificate holders. All earnings in excess of five per cent shall belong to the government as compensation for its services as trustee, thus acting as an additional incentive to profitable management.

It is expected that the ship canal between the Baltic and the Black sea, which is one of the greatest modern strategic and commercial works, will be opened for traffic by the close of the present year.

Unemployed Ironworkers.

It is possible there are more iron men with nothing to do in Chicago than idle mechanics in any other trade. All over the city the grim buildings whose funnels have been scorched and eaten by the blast flames are half deserted, and the white sands which shape the pillars and engines and pigs and rails and bars have not felt the sting of the yellow metal for a year. The weird places with shambling roofs and blackened sides, where have worked big armies of bare-armed vulcans, are now silent save for the clash of a few hammers that tinker on custom orders, or the songs of the polishers who oil and brush the rust on the rollers that have nothing to roll and the cranes that have nothing to lift. The molders and machinists, the big honest fellows who have skill in guiding intricate contrivances and have a sure knowledge of all the possibilities of iron, find their occupation half gone, and they join the sailors in the lament for the good old times of long ago, when the trades were young and the people few.

It is an undeniable fact that the ironworkers are having a hard row. The products of the foundry and machine shops are only in demand in the seasons when the factories are crowded and capital is feverish to venture into new fields, with new inventions. This demand fires the blast, puts all the pattern makers into activity, drives the machinery men into the night, and the trade finds itself rich and prosperous. This is not its condition this winter. The summer trouble closed many foundries, it checked investment, it canceled many contracts already upon the blue prints in the drafting room, and now that winter is here only a fraction of the employes is turning the lathe or heaving at the giant pots before the spouts of the ovens. Placards are nailed to the office doors, in plain black letters, that no molders are wanted under any consideration, and the doorkeepers demand a card to assure that the caller does not seek the master machinist in search of work.

One of the most promising features in the prospect of the ironworker is the increase in the foreign work in this town. It has only recently been developed that the Chicago foundries can teach all the world a few tricks, and in consequence their products are being shipped around the globe. Ocean boats are chartered outright, and deep in their holds are sunk beams to hold up the sides of the mountains over the Russian mines, or pumps and crushers and diggers for the diamond fields on the end of Africa. They land engines and presses in Australia, and pumps and mills for ores in Brazil. They do this readily, giving the item of competition far less consideration than European ingenuity, which quickly imitates the American notion. They dread more the eyes of the curious German, who wonders at the new wrinkles the Yankees are setting up in his own country, and his speed in reproduction, than they do the tariff on or off.

This branching out was one result of the World's Fair. The exposition filled the city last winter with men who were piteously unable to help themselves, but this year it has proved the salvation of the men who live by iron. It told the story of Chicago's possibilities to all countries, and all the foundrymen who made exhibits find their territory has been enlarged from city and county to State and nation, and then to the world. But for this, half the men now at work in this trade would be idle, and the poverty twice as great. There are eleven hundred men in a single shop across the river who are heaving and tugging at mammoth castings that go into the mines in the Zulu country, and this is but a sample. Charles E. Billin declares such contracts have been the salvation of the local business, godsends to the mechanics. They have kept one thousand men in places ample for two thousand, and have made places for one man in the four. There has been a dearth of city work, and until Mayor Hopkins took charge the Eastern firms had the preference in the bidding. It thus happened that with the army of machinists and molders empty-handed at home, the engines, pumps and bridges and structures of iron and steel, directly and indirectly built by municipal authority, have drawn their material from other centers.—Chicago Herald.

Enlivened by Gold.

Eighteen months ago, says the Denver *Republican*, it was thought by many persons that Leadville would be ruined by the decline in silver mining which was then seen inevitable. It was feared the famous camp would soon become almost dead and that property in general would depreciate in consequence of closing the mines. To-day Leadville is one of the best mining camps in the United States, and probably the most prosperous town in Colorado. Instead of depression, prosperity characterizes every line of business except it be some form of silver mining. The people are full of hope, and confidence is expressed in every countenance. There are no men in Leadville who grumble at its condition. All are confident of the future and assert with pride that they have the best town in the West. This wonderful condition of affairs is due to the working of gold mines and the sinking of shafts in search of more ore.

To Tax Mining Claims.

"A prominent mining man" tells the Denver *News* he has discovered a remedy for the financial stress under which the Legislature is laboring. His idea is to tax mining claimants $2 per year upon each claim held by the individual or company. A man holding five claims would be assessed $10 a year and the individual holding twenty-five claims would be obliged to pay $50 a year.

"I have been looking up the matter," said he, "and it is astonishing what a great source of revenue the State has been overlooking. At a moderate estimate there are 500,000 mineral locations in Colorado, which escape taxation. Each mineral claim is 300x1500 feet in area and embraces 10¾ acres. The claimant, in fifty cases out of one hundred, does not live in Colorado, but is simply holding on in hopes that somebody else will spend money in development in the region, and thus make the property valuable. It is possible that a man may do five or ten days' work on a claim in the course of a year, and announce that he has performed the requisite development work. In many cases no work is done at all, and yet the claimant will stand any bona fide prospector off with a shotgun if he enters upon the property. Why, I know of a group of claims that have been held for ten years as a speculation and practically no development at all has been made."

Somebody suggested that people of the mining counties would indignantly protest against any tax on prospects.

"Let them protest," was the reply.

"It is nothing but absolute justice that the properties should be worked or they should be thrown open to new comers. The farmer with his little patch in the valley is taxed for every dollar of improvement. The bona fide miner is taxed on the output of his mine or on the surface improvements, but the fellow with a shotgun is never touched. A man should be obliged to carry on business or quit. Many of the mining counties are asking for appropriations to build road or bridges. Let them assess the holders of mining claims and they will have money to build all the roads they want. Why, these people actually levy tribute on Denver to put into roads and bridges."

A listener, who evidently sympathized with the speaker, called attention to a reform which he desired to see carried out. "There is a tract of land in Costilla county," said he, "known as the Trinchera estate. It is owned by Dr. Bell, of Manitou, General Palmer, of New York, the heirs of the late Governor Gilpin and others. The tract has many valuable gold placers; it has iron mines, timber and stone. In 1881, 10,000 tons of magnetic iron were shipped from the estate to Pueblo, upon which the owners of the grant got a royalty of fifty cents a ton. Gentlemen, if you want to be treated to a surprise look up the reports of Costilla county and see how much this land grant contributes in taxes to the county."

An old timer from the Black Hills region told how the camp was made prosperous years ago. "At the very start," said he, "the miners held a meeting and discussed at length the amount of land that any man or company should be allowed to locate. The plan that was adopted proved to be the wisest action ever inaugurated in the district. It was the vote of the assembly that a man who discovered a lode could have the right to file two claims—one upon the lode and one as a reward for the discovery. All future comers were limited to one claim. There was no law for the action, but no man dared to run counter to the will of the community and gobble up an entire mountain."

The Black Hills man said further that in those days there were no disputes over apexes and side lines. A miner's claim extended straight down toward the center of the earth.

Wagon Bows.

The manufacture of wagon bows, such as are used for stretching canvas over wagons, is quite a little industry of itself. St. Louis can boast of turning out more of this product than any other place in the country. Lloyd G. Harris, president of the Lumbermen's Exchange, said recently that the fall had been a particularly good season for trade in wagon bows. The failure of crops in several Western States last summer on account of the drouth caused a boom in this trade. In fact, the emigration movement can be measured by the orders for wagon bows. Mr. Harris sold about $50,000 worth of bows this season, which is enough to equip 10,000 wagons. Speaking of the emigrating movement, caused by the drouth, Mr. Harris said that Arkansas and Texas have received many new settlers by it. The people of Texas have begun to realize that the best emigrants do not come from foreign countries, but from among dissatisfied citizens in the North and West. They have, consequently, turned their attention more to that class.—St. Louis Globe-Democrat.

TELEGRAPH LINES throughout the world aggregate 1,069,123 miles; of these America has more than half, 548,822 miles; Europe, 382,937; Asia, 67,875; Australasia, 47,812; and Africa, 21,687 miles.

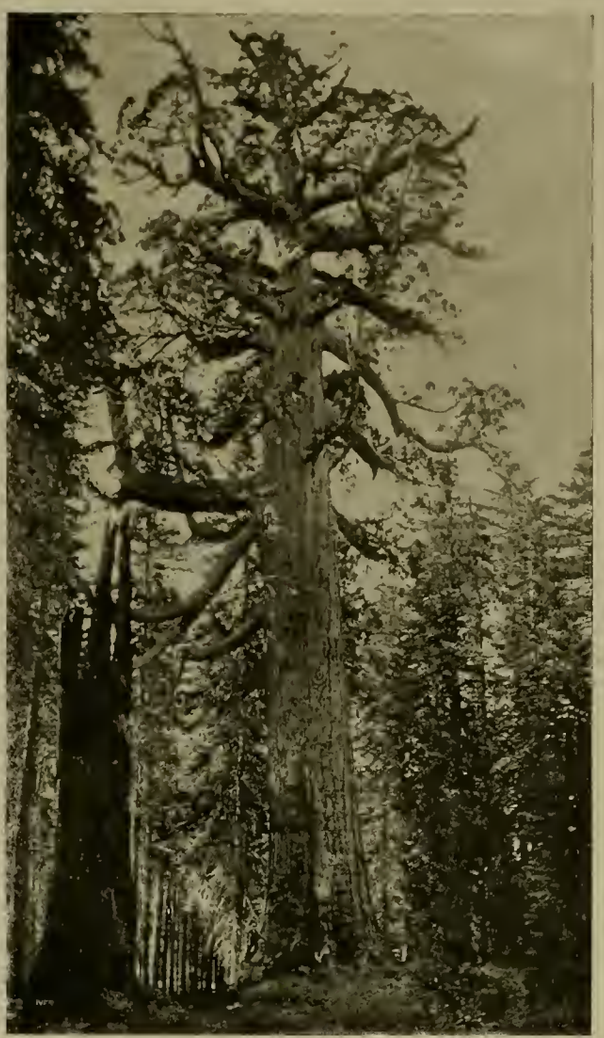
Specters of the Forest.

From the earliest written words the forest has furnished a symbolry for the various stages of human existence and for the various attributes thereof. The pliancy of youth, the exuberant strength of perfect maturity, the decay of age—all these and their innumerable accompaniments have suggested parallels between man and the tree. The greatest poets and the barbarous denizens of the untracked forest have risen together to the same height of imagery and the same tokens of emotion and sentiment. Evidently the tree appeals directly to the mind of man and conveys a lesson which needs no interpretation by culture or erudition.

The marks of age and approaching dissolution in the tree and in the man have perhaps been most widely noted. "I am like an old fir tree—dead at the top," said a decrepit chief of the Oneidas as he conversed with the pale face and showed his silvery locks. Hale old age has been brought to look upon the old monarch of the forest in these words: "His own bald head and grizzled locks—his own top with its decaying foliage—will make him feel a secret sympathy for some grizzled giant of the forest, old and decaying, but still strong and self-reliant."

Our engravings on this page suggest such thoughts as these. We have shown many trees in their prime and in their youth, but few in their old age and in the spectral form which some trees assume after the sap has ceased to flow and foliage no longer shields their stems from the bleaching sun. A dying *sequoia gigantea* is one of the themes of our engraver this week. It has reached its massive growth and its stature can be estimated by the pigmy-like men at its base. Death and decay have stricken it sorely. Storms have wrested from their places many of its spreading arms, and yet from the dying stumps there come a few foliage-bearing boughs to betoken its possession of life, even though strength and vigor have departed. Its majesty, even in death, over the full-grown and vigorous pines which surround it is but a symbol that some men, even in their death, are greater than the most vigorous humanity which bustles about during their declining years. Such have been some of the world's heroes—those in whom noble purpose has led to lofty thoughts and peerless deeds.

But there is a step beyond the symbolry of real life in the forest. The mystic and appalling are there as well, and how amid active life the specter stands both among men and among trees. Could there be a more forcible reminder of this fact than the ghostly form of a cypress of other days, which the engraving shows beside a roadway on Cypress point, in Monterey county? Very impressive are these bleached skeletons of the cypress. Gnarled and bent are they in old age, after a century perhaps of endurance of the ocean blasts upon a bleak promontory, but the strength gained by such knitting of fibers during decades of resistance will not permit them to seek rest prone along upon the welcoming breast of mother earth. Still must they stand, bleached by sun and beaten by rain and buffeted by winds, leading a spectral existence when the remains of other trees have silently sunken to rest and are indistinguishable in substance from the soil from which they sprang.



AN AGED SEQUOIA IN A PINE FOREST.

THE GHOST OF THE FOREST ON CYPRESS POINT.

According to the engineers of the Hydrographic Bureau, the level of the Gulf of Mexico is one foot higher than it was in 1859, and, of course, the encroachment on the surrounding coasts has been greater or less, depending on their character. In some places, where the marginal lands are composed of high, rocky bluffs, this change of level has gone on from year to year without attracting attention. On the other hand, many low-lying points (some that were once inhabited by the pioneer white settlers) are entirely submerged.

In a recent issue we commented upon the high price asked for platinum. An American technical journal takes us to task on this point, and although we do not see any reason to alter the opinion expressed, we are quite ready to listen to the other side of the question. It is stated that popular opinion concerning the great value of platinum is largely at fault. One frequently hears the statement that platinum is more valuable than gold. Nothing, we are informed, could be further from the truth. Pure platinum is worth about thirty-three shillings per ounce. Once, owing to the speculations of certain brokers, it reached a top figure of about sixty shillings per ounce, but soon fell back to the normal, and has in recent years been as low as twenty-five shillings. Pure gold all over the world has never been less than an average of four pounds per ounce. About three tons of platinum are annually consumed in America in the manufacture of incandescent lamps and for electrical purposes, while another ton is used for the more prosaic but no less useful purpose of being made into parts of artificial teeth.—Industries and Iron, London, Eng.

The latest dictionary contains 349,333 words. The old unabridged had only 125,000. Times are getting harder every year for the man who does not know how to spell, but life is getting easier all the time for the people who want to conceal their thoughts.

Senator Jones' Luck.

Major M. P. Handy, in the New York *Mail and Express*, gives a conversation with a Texas Congressman, who makes the following reference to John P. Jones: "Senator Jones," said the member from Texas, while he is a man of great native ability and has a mind enriched by reading, travel and experience, had his wealth come to him at first by a very slender chance. He was, by the way, although most people have forgotten it, the first of the multi-millionaires who came out of the Pacific coast mines to dazzle the East with their wealth. The first time he came to New York after making his great strike in the Crown Point mine, I came with him. We went to the Grand Opera House, on Twenty-third street, to see Charles Fletcher play 'Monte Cristo.' It was a great performance and impressed Senator Jones very much. When I commented upon the audacious improbability of the story of Edmund Dantes, he challenged the comment by the only reference to his own wealth which I ever heard him make.

"'Why,' said he, 'the story can be almost matched in my own career. Three years ago I was a miner with pick in hand and a Davy lamp on my hat, spending eighteen hours out of twenty-four in the bowels of the earth. Now I am a United States Senator and the owner of $10,000,000. Neither Dumas or the author of the Arabian Nights Entertainments could invent a story more wildly improbable to the commonplace imagination.'

"I asked the Senator then," continued the member from Texas, "the very question that we are considering—how much luck had to do with his amassing such a fortune?

"'I won't say everything,' was the reply, 'but you may judge for yourself how much when I tell you that if I had not taken a certain side of the street one day I probably would have been back at this moment on an Ohio farm tilling the soil with my own hands. It happened in this way: I had made some money during flush times in California, but struck a bad streak of luck and lost it all. Worse than that, I owed about $4000, without any prospect whatever of being able to pay. Being discouraged, I determined to go back to the States and try to make a quiet living in my old home. With that view I bought a ticket to New York by the Pacific Mail line and had actually gone aboard the vessel when I remembered that I had left some of my luggage at the hotel. I hurried back after it, and in doing so, by mere chance, perhaps because it was sunny on the other, took a side street upon which I had never walked before in my life. In my hurry I ran against an old friend, Alvinza Hayward by name. He asked me where I was going. I told him, and he begged me to reconsider. I was the very man he wanted to see. He wanted me to go and take the superintendence of a mine that he thought might have a good stake in it. He offered me a fair salary, which I accepted. I ran and got my things off the boat, and in a week was at work again in the mines. Before the year was out I was a millionaire. All the results of my forgetfulness in leaving a piece of baggage, and because I went up one side of the street instead of the other.'"

The gold-beating industry is threatened with extinction by the Swan process of preparing gold leaf. This consists of depositing a thin coating of gold upon a copper base, and then dissolving the base by submission to perchloride of iron. It is stated that the leaf may by this means be made of the thickness of $\frac{1}{4000000}$ of an inch. The copper being ultimately recoverable, the process is reported to be in every way economical, the reduction in weight in the leaf effecting a further saving of eighty per cent of the precious metal.

A London journal says that since the introduction of the electric light public performers are able to preserve their voices in better condition, and are fifty per cent more often in good voice. They are cooler, do not perspire, and are not husky while singing or acting. The atmosphere is better, and the equal temperature of the whole building has greatly diminished the risk of taking cold. Their throats are not parched and their voices not injured so much as in houses where gaslight is used.

The Executive and the Mining Bureau.

To the Editor:—Your able defense of the Mining Bureau, iu the attack upon it recently made iu the Legislaturc, enlists the sympathy and will receive the cordial support of the whole mining community of California. Periodical as these attacks bave been, and due to sectional prejudices aud the ignorance of the best interests of the State, the present attack appears in a different light and from a source least expected by the miners of California. Senator Langford's bill is but a uatural sequence of the utterauces contained in Governor Budd's inaugural address, in which his sweeping scheme of retrenchment and reform was promulgated, and its methods now become appareut in the effort to destroy the usefulness of the only State institutiou iu California conducted in thc interest of and for the benefit of our mining iudustry.

I sincerely hope that but few of our representatives will find, as Governor Budd fondly imagines, a panacea for present extravagance aud mismauagement in bis hobby to incorporate with the State University the most of our State commissions, societies and bureaus; but whatever policy may be found to defend such action, it cannot be said to exist in the case of the Mining Bureau.

Every citizen of California, familiar, like the writer, with this institution, from the time wheu Henry G. Hanks aud his solitary assistant struggled to obtain its recoguition until the present day, can trace its growth and development and bear testimony to its usefulness and freedom from the control of cliques and of the political machine. To-day we find its well-arranged but somewhat confined museum presenting to citizens aud strangers alike an epitome of the mineral wealth of our State; its small but useful library offers information to our miners; its laboratory gives its services to investigate our minerals; and its chief and his staff respond courteously to any reasonable demand of the public. A criticism of its activity can ouly find fault with a short period during Mr. Irelan's administration, when the redundancy of its reports in extraneous matter was justly objected to. With the means at its command, the last (twelfth) report may be said to be a model of its kind, and contains many valuable papers, such as "Electric Transmissions in Mining Operations" and "Auriferous Conglomerates of California," while its bulletins lately issued on "Mine Timbering," "Gas and Petroleum Formations" and "The Cyanide Process" furnish practical iuformation of the greatest value to the whole State. The reports of the Bureau are higbly valued by mining men all the world over, aud have been absorbed with avidity, so that the older issues cau scarcely be had at any price—a striking contrast to other reports issued by our State institutions.

During the present period of finaucial and industrial depression, when our mining industry is about the only one enjoying any prosperity and giving a fair promise of further and healthful expansion, due largely to the activity of the Bureau, it becomes not only injudicious but highly reprehensible to discard the services or decry the usefulness of a faithful and efficient State institutiou, on the score of a false economy which lavishes millions while it denies thousands. In so doing it is proposed to enter upon au experimeut tried time aud again in all civilized countries and always found wanting.

As Mr. Laugford's bill proposes to merge the Mining Bureau into the State University, it will not be out of place to review the history of that iustitutiou and its influcnce upon the mining industry of California, and in so doing the writer disclaims any hostility to the University and its faculty, whose scientific abilities and standing are well known aud ackuowledged by our citizens of all classes.

Founded in 1869, aud liberally endowed by the State aud the general Government, and constantly enlarged aud extended by liberal and seldom grudged appropriatious, it possesses all thc elements of large and extended usefulucss *within its particular domain*. At this session it is an applicant for appropriations aggregating $750,000, and so far our Executive bas not raised his voice against this expenditure. Its collections in natural history are large and constantly increasing, and comprise all the material collected by the State Geological Survey under Professor Whitney; its laboratories and worksbops are large and generally well supplied with tools and instruments; it bas its owu press, its experimental grounds, and its own football club. Contrasted with all this wealth of material, the resources of our Mining Bureau appear ridiculously small and insiguificant, even to its oldest friends.

Among its many and varied departments, the University maintaius a College of Miuing, in which Prof. Samuel B. Christy is an eminent and able instructor. This college has been in active operation for at least fifteen years, and its equipment will soon be complete, a full complement of milling machinery only being lacking.

The University issues from time to time bulletins of the special work doue by its faculty and its students, but no effort is made for their distribution, with the result that they are but little known to the press or the people of this State, no matter wbat their scope or importance may be. Every year the graduates of the University go forth into active life, well prepared for their duties, and to illustrate in their lives the teacbings, tbe precepts, the metbods and the spirit of progress that animates their "alma mater" in the quiet sbades of Berkeley.

With all this wealtb of expenditure, of preparation and of labor, what has been its influence intellectually, morally, and industrially, on the progress of this State during the twenty-five years of the life of the University?—and I pause bere to ask the members of our Legislature and our Executive that simple question.

In all that relates to Letters, Agriculture, Law, Medicine, and perhaps even to Chemistry, Mechanics and Engineering, I leave the answer to abler voices than my own. But in the department of Mining, a life work spent in the industry, may perhaps entitle the writer to form a fair judgment.

Underlying nearly all the practical operations of mining and milling as practiced in California, and governing or influencing their results, exist various physical forces but little known and quite obscure even to the average man of intelligence and education. Practical experiment will occasionally indicate the laws governing such forces and lead to economic success, but more frequently they remain unsolved enigmas, and the work done under such conditions is but a groping in the dark for approximate results.

The recognized improvements in the treatment of ores in California generally resolve themselves into perfected mechanical appliauces. As instances of but imperfectly understood metallurgical operations may be quoted: The amalgamation of gold and silver, the laws of which are as little known to-day as they were a hundred years ago; the laws governing wet and dry ore concentration; the chemistry of the application of chemical solvents to ores and ore products, especially in the cyanide process; and last, but uot least, the physical condition of our gold-bearing gravels. Confronted with such obscure questions in his daily work and not finding any information in standard works of science or aid from the teachings of our universities, the investigator pursues his way slowly and laboriously, chiefly for want of means, of instruments and apparatus, and perhaps spends half a lifetime to attain his object, if he succeeds at all. It is by emperical methods aloue that nearly all our mining and metallurgical operations have attained their present status, among which the economic application of the chlorination of gold ores may be mentioned and in which the names of Deetken and Theiss will always be remembered. It is true that honor is due to the work done by Prof. Christy in his researches on the volatility of gold in chlorinatiou, but the very methods of the University prevented for years this knowledge from bearing fruit, as it was not given to the public press directly, but just became known in the trausactions of the American Iustitute of Miniug Engineers—a record which, containing as it does the most valuable and important observations on subjects of mining engineering, cannot be said to be available for the general public.

An intimate knowledge of the condition and distribution of gold in our gravels, to be gained only by microscopical investigation, would, years ago, have modified the methods of hydraulic mining to such extent as to have prevented the injury to our valley lands; it would have saved more than one-half of the waste in gold now incidental to the method, and would have healed the distrust and the dissensions now so unfortunately preventing our farmers and miners from joining in mutual efforts for the common weal.

Our vast fields of placer miues yet remaining intact and generally overlooked by the professional geologist in his investigations in systematic geology, will yet tell a woudrous story of later geological eras when the evidences of our auriferous conglomerates, lately studied by Mr. R. L. Dunn for the Mining Bureau, have been interpreted and his deductions, as supported by the writer's experience, have been confirmed, in whicb case these formations would be analogous with the South African reefs in the Transvaal.

The writer will not attempt to define the scope of a State University or the duties of its faculty; its regents, if they represent the needs and aspirations of Californians, should determine these; but if such an institution, absorbing much of the wealth of the State, and ambitious of still greater power, should be more than a great high school, and should give part of its work to original scientific research and to the solution of important economic problems, the foregoing instances will serve to show but a few of the lines on which such research could be prosecuted for the advancement of mining and metallurgy in California. What, then, bas the State University done in these or kindred fields pertaining to its College of Mining?

To the reports of the United States Government; to the Geological Surveys, State and governmental; to the transactions of technical, engineering and scientific societies on this coast and elsewhere; to the Mining Bureau; to tireless, independent investigators; and to the untiring energy, industry and perseveranee of our mining men, do we owe what progress we have made in the mining industry, but not in any perceptible degree to the labors or the progressive spirit of our State University!

This lack of interest in tbe application of scientific research to practical industrial problems can hardly be blamed on the faculty of the University; it is more to be ascribed to the system, or to tbc general tendencies that apparently control nearly all the larger and wealthier American universities and colleges, which, once secure in wealth, influence and respectability, fall into the common rut of indolence and exclusiveness, and generally repudiate or fail to recognize merit in any original work done by investigators outside of their own collegiate limits.

But apart from this the University has its mission, distinct and divergent from that of a Mining Bureau, which, like our own, as defined under the Act of 1893, has its special province which the State University can never fill. The experience of older communities and nations in tbis respect is too well known to be disregarded, and is recommended to our Executive for his serious consideration. All the progressive nations of Europe, while possessiug or claiming the oldest, wealthiest and best equipped collegiate institutions of the world, have long ago severed the connection between their universities and tbcir mining schools, their technological institutes, their agricultural schools, and their museums and bureaus of applied science. Such is the case in England, France, Germany (famed for its universities as well as its mining schools), Belgium, Russia, Sweden and Norway. Such is also gencrally the practice in the eastern and middle States, where the most useful agricultural and technical schools have with manifest advantage been divorced from their colleges, and where more will follow, to meet the common sense demands of the American people.

It bas been left to the Governor of California to propose a retrograde movement and to attempt to sacrifice usefulness to prestige and privilege under the alluring watchword of retrenchment and reform, and in oblivion of the fundamental principles of true democracy; but the writer believes that the unbiascd common sense and justice of our legislators will prevent this injury to our mining iuterest, and instead of crippling the Mining Bureau or of allowing its absorption by our ambitious and powerfully supported University, they will provide more liberally than usual for our one popular institution, to the end that its usefulness may be exteuded and that the Mining Bureau may long remain as an aid and encouragement to that intrepid, patient and well-deserving part of our citizens—the California miners.

In conclusion, Mr. Editor, I would suggest that the Mining and Scientific Press should publish in an early issue, for public information, a comprehensive table of the endowments, incomes and appropriations in aid of the State University, from all sources, from its first foundation, and also its yearly expenditures, together with a full list of its ex-officio and appointed regents, who so far have withheld such information. In conjunction with this, the munificent appropriations for the Mining Bureau may be given as a parallel, so that the expenses incurred by the State for the so-called higher education may be contrasted by our economists with the sum allowed for the technical instruction of the common people.

J. A. Edman.

Meadow Valley, Cal., Feb. 14, 1895.

Reports of Two Experts.

Regarding the recent sale of the Poormau aud Tiger mines, P. C. Bunn, sent from London to examine the mines, says:

The Poorman and Tiger claims are both located upon the same fissure. The profits from the Poorman during the last five years have been $790,682. The Tiger mine, having been run by a private individual, it is impossible to get the gross production accurately, but for the present year, during which it has been worked 103 days, the net profit was $60,933. The railroad strikes and a serious washout of the railroad track prevented work being carried on for a longer period this year. The amalgamation of the properties would effect a great saving in the management and operating expenses. There is no douht hut that the mines can he worked to such depth as machinery can properly handle the product, and more than the present rate of production can be maintained for a great many years to come.

J. L. M. Fraser, the other expert from London, says:

The reserves of the Poorman mine above the ninth level are 135,700 tons; the stopes in these reserves produce 1590 tons of shipping ore per month. In the Tiger mine the eighth level is being driven in the rich shoot of ore which, for the first 115 feet, was ten feet wide—the present end is 30 feet—of ore; the stopes in these reserves produce 1282 tons of shipping ore per month. I value the plant and machinery at $516,000 (£104,000). By the amalgamation of the two mines I estimate a saving will he effected of $50,000 per annum, and a further saving by using the combined water powers. The output of the two mines should be 35,000 tons of shipping ore per year, which, at the present low prices, would produce a profit of $399,350 per year.

Colorado Mining Stocks.

COLORADO SPRINGS, COLO., Feb. 9, 1895.

Dissatisfaction and stagnation apparently reign supreme so far as mining stocks are concerned. Argentum-Juniata and Mollie Gibson appear to be entirely responsible. Rumored litigation emanating from the old Josephine company against the latter is having a depressing effect among a certain class. The authenticity of this it is impossible to trace. There are also rumors in circulation that the former company is liable to have trouble, to the effect that other parties have secured a patent upon a portion of territory supposed to be operated by the company. Both of these are absolutely rumors and can be taken for what they are worth, as it is exceedingly difficult to trace them to a reliable source.

I believe there will be an early reaction in silver stocks very shortly, although Mollie Gibson may be selling at nearly its market value. I truly believe Argentum-Juniata is a good purchase, as it is practically an unexplored virgin mine. But regardless of this, silver stocks are not in high favor, not excepting the Creedes which heretofore have been very strong, but they are now generally weakening, as the offered price of United Mines will attest. Happily, such stocks as Anaconda, Portland and Union are having a stimulating effect upon the market, which, in a way, has a tendency to overcome the injurious effect occasioned by silvers.

In order to insure permanency to mining stock speculation and retain public confidence, the management of companies must be more economical, honest and intelligent, and until such a state of affairs is effected, the business will be, as it now is, invariably looked upon with more or less distrust, and the experience of the ordinary outside investor can only be of a disastrous nature. In many organizations like Portland, Victor, Moose, Nugget and others, principally close corporations, there is evidence of reform, but unfortunately the outsider is either not attracted toward them, or given an opportunity to share in these mining plums. The avariciousness for quick returns, disinclination of brokers to recommend anything but listed stocks, is principally responsible for this.

The chief disadvantage of unlisted stocks is the difficulty of immediately realizing at a moment's notice without materially sacrificing them, but this is generally counteracted by the regular reception of dividends. If investors would give more attention to permanent investments and less consideration to what cannot be considered anything but petty gambling, they would soon look upon mining with more favor, and if brokers would carefully consider the possible result in legitimate mining and not give so much attention to stock manipulation, it would be better for all. Very respectfully,

F. H. PETTINGELL.

As Told by Judge Goodwin.

Judge Goodwin, who so ably fills the editorial chair of the Salt Lake *Tribune*, occasionally unbends to the extent of putting in articles not wholly statistic or didactic in his leaded columns. In the issue to hand he narrates the following:

A Nevada man once went to Europe to sell a mine. When he got his fare paid in New York he had the bond of the mine and $30 in his pocket. He found some soft Englishmen aboard who thought they could play poker. When he reached Liverpool he had the bond and $1200 in his pocket. He had not a vast amount of intellect, but he had an unlimited supply of that article called gall. In two months he had £8000 in the bank and had himself elected superintendent of the company in Nevada at a generous salary. He was feeling well. Going up street he saw some strawberries in a window. He did not remember that it was in the winter time, and that possibly strawberries were a little expensive, so he went in and ordered a plate of strawberries. The waiter stared at him and said: "I beg your pardon." "Don't you understand English?" asked the Nevada man, "I want a dish of strawberries." The waiter bowed and went out. Two English gentlemen were sitting at a table near by, and the Nevada man heard one of them say in a low tone to the other: "Upon my soul, I think when that Yank comes to pay for his strawberries he will never order any more in the Kingdom." The waiter brought a few sickly-looking berries, which were quickly disposed of, and then asked the amount of the bill. The waiter replied: "One guinea, if you please." "What!" said the Nevada man. "One guinea, if you please," answered the waiter. "Why, —— ——," said the Nevada man. "I thought strawberries were scarce and high. Bring me another plate." His gall still triumphed. When he returned he told the story, and a friend asked him if after he disposed of the second plate he ever did buy any more strawberries in the Kingdom. "Not a —— one," was the reply; "that last one was all for the American eagle."

"WHY does a bicycle stand up?" is a question which has been quite thoroughly discussed. But what the average amateur wants to know is, why a bicycle *doesn't* stand up.

Tried the Experiment.

In the winter of '93 4, and again in '94 5, it was suggested that relief could be afforded some of the indigent unemployed, who annually crowd into this city, if they were furnished with mining implements and sent to the foothills to try their luck at placer mining. The plan met with a good deal of well-grounded opposition, but one man, P. M. McFadden, prominent as an "organizer" of the unemployed, thought he would try the experiment. He claims to have made a success of it. Here is his alleged experience:

"I first went to Folsom and there got a little work on a gravel train. I saw hundreds of Chinese doing placer mining the old-fashioned way, and I followed their example. After five months' work I can say that it pays much better than cleaning the streets, and that there is room for thousands in this State to do this work. I located a claim on the Natoma grant, near Folsom. Five dollars bought me a rocker and pick and I rented the water privilege for $3 a month. I had never done mining before, but I made 60 cents a day from the start, and after a little advice from experts I readily earned $2 to $3 a day. Once I earned $50 in a few hours.

"The land around Folsom is owned by a large company, which allows mining on its ground and charges miners for use of water out of the ditch. My expenses were seldom over $2 a week, and one can fare very well at that—flour, bacon and potatoes, with a little fresh meat once or twice a week. There are plenty of empty cabins around that one can use, and no one will object.

"There are twenty men on the Natoma grant working just as I did, and all are making more than a living. There is room there for hundreds, and all over the State there are good placer districts where thousands of the unemployed can find work."

Structure of Gold Nuggets.

The structure of gold nuggets is the subject of a paper recently contributed to the New South Wales Royal Society by Professor Liverbridge. Gold nuggets, on being cut through, or sliced and polished, and then etched by chlorine water, were found to exhibit a well marked crystalline structure, closely resembling the figures shown by most metallic meteorites. On heating the nuggets in a Bunsen burner, blebs or blisters form, on both the polished and unpolished surfaces; and, on still more strongly heating, these, in some cases, burst with sharp reports, and pieces of gold are projected with considerable violence. As no explosions have been observed on dissolving or eating away the crusts of these blisters by chlorine water, it would appear that the blebs are probably due to the vaporization of some liquid or solid substance. As soon as a fresh supply of nuggets is obtained, experiments will be proceeded with to ascertain definitely whether gold nuggets contain occluded gases, or liquids, or solids which are vaporizable. In slicing some nuggets, scattered granules of quartz were met with inside, although quite invisible outside, and at first it was thought that the explosions might be due to the quartz, but the gas, in some cases, continued to issue from the burst bleb—where the aperture formed was small—and forced the Bunsen flame out into lateral jets, just as if urged by a blowpipe.

NOT many days ago, says the New York *Herald*, a few gentlemen connected with the telegraphic or electric business were assembled in a room in the eleventh story of the new Postal building on Broadway. They had not been there very long when astonishment was depicted on their faces; and by and by found expression in words. A book on the table about which they stood or sat was speaking. "Is it possible," exclaimed Mr. Chandler of the Commercial Cable Company, "that those spoken words can come from that book?" "Yes it is," said Mr. Francis W. Jones, the electrician of the company; "that is Mr. Marshall's telephone." W. Marshall, of 709 Lexington Ave., had prepared this remarkable feat for the electricians. He began by taking up an ordinary book and placing in the leaves several slips of tin foil, about one and a half inches wide and four inches long. Then he attached a couple of fine wires to another room, where they were attached to the transmitter of a telephone. Then a conversation began, with Mr. Marshall in one room, and one of the persons in the room where the book lay. Each word that came from the book could be distinctly heard in every corner of the room. The visitors had never experienced anything of the kind before, and they said it would eventually revolutionize telegraphy.

A PULSEOMETER has been invented with which it is claimed it is possible to tell to a fraction the exact condition of the heart beat. An electric pen traces on prepared paper the ongoings, haltings and peregrinations of the blood, showing with the fidelity of science the weakness of the telltale pulse. This should, it is considered, be of special advantage to life-insurance doctors, as well as to the profession at large.

To Save Fine Gold.

B. M. Whiting of Spokane, Wash., is making a machine for saving fine gold. The principal new feature is a revolving perforated cylinder, set at a slight inclination downward from the hopper. This is encased in a revolving drum and set in a box, equipped with riffles. There are two sets of copper plates and quicksilver riffles, and so constructed as never to clog. Within the drum and outside the cylinder are three copper balls, quicksilvered, kept in motion by the revolutions of the drum, and designed to pick up any straying particles of gold not caught in the other process. The dirt passes directly into the cylinder from the hopper, the water and all the fine substances passing through the perforations and not permitted to escape without coming into contact in passing over the system of plates. The gravel and all coarse stuff, after being thoroughly washed, is expelled at the end of the cylinder and sluiced out of the way. The weight of the drum and cylinder in the largest machine is about forty-five pounds.

This machine is designed to treat twenty-four yards of dirt in a day of ten hours. It requires fifteen inches of water, necessitating a six-inch pump at thirty-five revolutions a minute to raise the water ten feet, which is deemed sufficient on ordinary placer ground, as the height of the machine is only three feet. The machine itself is easily operated by hand, and the inventor claims that in actual service on the ground it will require less than a half-horse power, while the smaller sizes, intended for prospecting, can be worked by two men, one to shovel in the dirt and the other to turn the crank. It is so constructed that a cleanup can be made every day, or as often as desired.

If the machine performs as successfully in the field as it does on dress parade in the factory, it will largely revolutionize placer mining on the Columbia and tributary streams.

What Colorado Miners Want.

The Rocky Mountain *News* prints an open letter, which it states was signed by ninety-six working miners and addressed to the Tenth General Assembly of Colorado, in which they suggest amendments to the laws, as follows, so as to make:

1. Eight hours a legal day's work for all men working under ground.
2. Require all mines 100 or more feet deep to have at least two exits.
3. To forbid storage of powder or caps in or within fifty feet of shaft house.
4. To prohibit the employment of coolie labor in mines.
5. To require all incorporated companies to pay their laborers at least semi-monthly.
6. To compel all mining corporations offering stock for sale, or those whose stock is held by any person other than the directors of said company, to publish semi-annually, in some newspaper of general circulation in the county where they operate, a full statement showing assets and liabilities, income and expenditures, this statement to be signed under oath by at least two of the company's directors.

The Boot on the Other Leg.

California, Colorado and Montana all seem to be deriving benefit from the increased activity in gold mining, and our exchanges unanimously speak of the unusual amount of gold coming into the local mints. In the first-named State there is reported to be a very good and brisk demand for gold mining properties. People are commencing to have a fuller appreciation of the industry, and they are on the lookout for profitable investments. The San Francisco MINING AND SCIENTIFIC PRESS complains, however that "the only difficulty is these people want developed claims which are paying or about ready to pay, and these the miners want good prices for. A good many people in search of mines want developed ones at the price of prospects." In Australia the boot is on the other leg. Generally speaking, those who have mines to dispose of try—and in the case of West Australia have succeeded to a remarkable degree—to get for prospects the prices of developed properties.—Australia Mining Standard.

PHYSICAL DETERIORATION has been increasing steadily in the British army in the last twenty years. In 1875 there were only 65 soldiers in a thousand under five foot five; last year there were 127. The 608 in a thousand measuring less than 37 inches round the chest has grown to 685. The proportion of enlisted men under 20 years of age has increased from 97 in a thousand to 170, while that of men over 30 has decreased from 340 to 88 in a thousand.

THE Tacoma chamber of commerce has forwarded to Washington city a vigorous protest against the provision of the sundry civil bill by which a portion of the coast and geodetic survey force is to be dropped.

Scientific Progress.

Advice to Inventors.

Inventors may be roughly divided into three classes: (1) Those who, as the result of accident and momentary inspiration, think out one or two devices having no special relation to their ordinary pursuits or needs; (2) persons who have a well-defined mechanical genius, aud are regularly employed in some manufacturing trade, and a good deal giveu to the use of tools and the study of problems incidental to mechauics; and (3) experts in electricity, steam engineering, steel and irou works, or some other industry, who are constantly employed by some one else at a salary to improve existing methods and appliances. The first two of these classes, together constituting uinety-nine per cent of the whole, may be called, without disrespect or disparagement, amateur inventors. Those coustituting the third set are really "professional inventors." Some excellent suggestions, offered to the latter in the *Engineering Magazine* for February, by Henry Harrisou Suplee, deserve consideration by the former.

This writer's first recommendation is that when a man gets an idea he should go to work and find out what others have done in the same direction., so that he will not discover, after throwing away a lot of labor and time and perhaps money, that some one else has tried the same thing and succeeded, or has tried and failed. All failures should be carefully studied, so that the reasons therefor cau be detected and a repetition avoided. It is well to collect facts, either in the form of clippings or written memoranda, copies of pateuts or manufacturers' catalogues, about other devices like that which the inventor has in mind. Above all, it is important that a man, before trying to solve a problem, carefully inquire whether it is worth solving. Merchants, mauufacturers and consumers should be consulted to see whether a thiug would sell if perfected and put on the market. Finally, mechauical laws, means of accomplishing an end simply without waste of power or material and fuudamental principles should be eagerly and thoroughly studied in books, by personal observation aud by inquiry. It is the iuventor who works along these lines and looks upon invention as a science and not as a haphazard affair who makes the greatest hits commercially.

Freezing a Soap Bubble.

One of the most wouderful achievements in recent scientific progress is the liquefaction of air. A remarkable story of this curious substance and a soap bubble experiment is told in a late review of scientific experimeuts:

"A frozen soap bubble, broken in two, and floating like an iridesceut, transparent egg shell on the surface of a vessel of liquid air was one of the marvels exhibited by Professor Dewar iu a recent lecture before the Royal Iustitute of Great Britain. The lecture was on atmosphere and the curious effects of intense cold, the liquid air and the soap bubble being adjuncts introduced to facilitate some explauations. A few spoonfuls of the liquid air were poured into a vessel and the intense cold caused by evaporation immediately induced a miniature snowstorm in the atmosphere directly above the vessel.

"A soap bubble was then lowered into the freezing stratum above the liquid air. Almost instantly there was a change in the color of the transparent globe, the bubble becoming much darker; the movements of the rainbow film grew slower; it contracted somewhat in size and a moment later froze.

"A slight but dexterous movemeut of the rod upon which the bubble was suspended broke the latter in two pieces, which fell, cup side up, upon the liquid air and there floated for an hour, gradually accumulating a tiny snow drift from the almost imperceptible precipitation constantly going ou in the freezing atmosphere above."

THE astronomical observatory erected by Professor T. S. C. Lowe, is seven miles by rail north of Pasadena and sixteen miles northeast of Los Angeles. The Sierra Madre mountains, upon which the observatory has been placed, have an east and west trend, and rise abruptly from the San Gabriel valley on the south to an altitude exceeding 6000 feet above sea level. The observatory is built upon a southern spur of these mountains. Its altitude is about 3600 feet above the sea, and 2000 feet above the hills at the base of the mountains, which are very steep at this point. While the crest of the range rises high above the observatory and shelters it on the north, leaving, however, the north star visible, the entire southern horizon is uuobstructed, exteuding to the rim of a large segment of the ocean. Astronomically it is nearly at the intersection of the 34th parallel of north latitude with the 118th meridian of W. longitude. The new observatory is well equipped with the great sixteen-inch Clark reflector. Among the other instruments are many which have done notable work in the Warner observatory at Rochester under the directorship of Dr. Lewis Swift, the emiuent American astronomer, who uow superintends the Lowe observatory. The buildings consist of a central tower thirty-two feet in diameter, surrounded by a light dome, and two unequal wings, the smaller one contaiuing a dark room for photographic work, and the larger being furuished with cases for the extensive astronomical library of reference gathered by Dr. Swift in the course of his professioual career.

What a Cannon Ball Can Do.

In dwelling upon the wonderful power of the guns of the Indiana, Albert Frankliu Matthews, in an article on "The Evolution of a Battleship" iu the *Century*, gives illustratiou from the recent Chilean civil war, showing the effectiveness of the smaller sizes of brcechloading rifle guns.

A shot weighing 250 pounds from an eight-inch gun of Fort Valdivavia, in Valparaiso harbor, struck the cruiser Blanco Encalada above the armor belt, passed through the thin steel plate on the side, went through the captain's cabin, took the pillow from under his head, dropped his head on the mattress with a thump but without injuring a hair, passed through the open door into the messroom, where it struck the floor and then glanced to the ceiling. Then it went through a wooden bulkhead an inch thick into a room twenty-five by forty-two feet, where forty meu were sleepiug iu hammocks. It killed six of them outright and wounded six others, three of whom died, after which it passed through a steel bulkhead five inches thick and ended its course by striking a battery outside, in which it made a dent nearly two inches deep. It was filled with sand. Had it released deadly gases no one knows what damage it might have done.

A 450-pound missile from a ten-inch gun in the same fort struck the same vessel on its eight-inch armor. It hit square on a bolt. The shell did uot pierce the armor but hurst outside the vessel. It drove the bolt clear through, and in its flight the bolt struck an eight inch gun, completely disabling it. Such is the power of the smaller sized guns.

THE Turkish Ministry of Public Works has determined upon the reconstruction of the ancient water conduits of Jerusalem, dating from the age of King Solomou. By this means it would be possible to couvey 2500 cubic meters of water daily to the Holy City. Of this it is proposed to give 1000 meters away free of charge to the poor of Jerusalem, the distribution to take place at the Mosque of Omar, the Holy Sepulcher, and other places frequented by pilgrims. The new conduits are to be joined to the aucient aqueducts of Arob, and are to be carried through a tunnel 3570 yards iu length. The total outlay in connection with these works is estimated at 2,000,000 francs.

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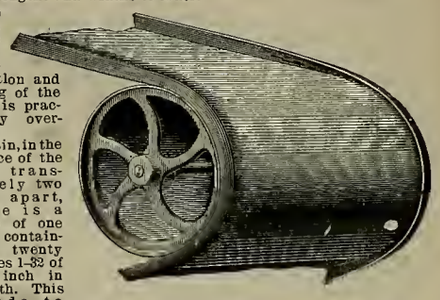
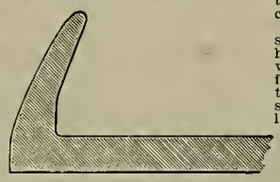


Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.



Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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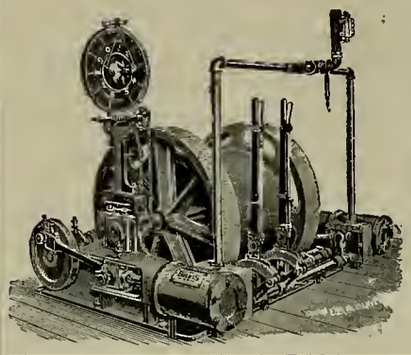

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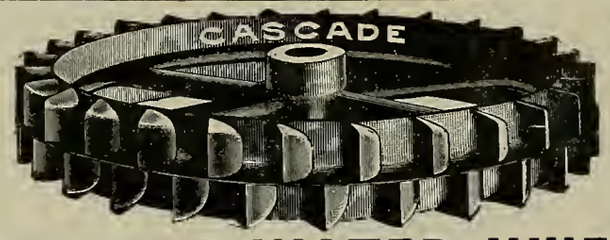

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Mechanical Progress.

New Uses for Babbitt Metal.

I shall attempt in this article to give some of the numerous uses to which babbitt metal can be applied around the mill and workshop outside of its accustomed place in journal boxes. The writer of this was employed to fire a sawmill, and when I went and took charge of the machinery I noticed that the shaft of the rival pump that fed the boilers with water was sprung, caused by the plunger unscrewing from above, consequently lengthening it till it struck the bottom in running; the result was that when we started up, the wabble of the eccentric soon broke that rod in two. As it was thirty miles to a machine shop we were in a dilemma. I took the broken parts and shaft out and carried them to the proprietor and told him I would take them to the blacksmith's, and perhaps they could fix it. I also told him that if they could not, I thought I could make one out of babbitt metal. I took them to the shop and had the shaft straightened, but when they commenced work on the eccentric rod they broke it and it could not be repaired there. I then took the pieces with me and got a keyhole saw and made my molds out of wood. I then cast the broken parts out of the babbitt metal and got back to the mill in time to put them together and be ready for sawing the next day. I ran that mill two years, and that babbitt machinery was just as good when I quit as when I first put it on.

I do not advise the use of babbitt metal in every case, nor where a person is close to a machine shop, but in cases like the above where it would take a week or longer to get the repairs from the shop.

If you have a shaft to put up and have no cast bearings for it you can make them out of babbitt metal. I put up a two and one-quarter inch shaft and made the whole bearings out of babbitt metal. It has been running six years, and the bearings are apparently as good as when first made. I first made my bents and put them in place, having the top of the bents about one inch lower than the bottom of the shaft, when it was in place. I then put my shaft in place and got a cap block and cut a square notch in it about two inches larger than the diameter of the shaft. I placed this notch down over the shaft, the cap block resting on the bent with the shaft in the center of the notch. I then pinned the cap block solid to the bent, and bored a hole through the cap block to the notch to put a pin down against the shaft in order to have an oil hole when the box was run. We now fix the shaft in the center of the notch resting on outside supports. Get some good clay and pasteboard to fix the ends of the notch ready to run, leaving a place at the top to pour the metal. If you have been careful you will get a good boxing.

If your shafting is not perfectly round, it is best to tie one thickness of paper around the shaft and run the metal around that, turning the shaft a few rounds by hand, when the babbitt gets nearly cold.—H. N. Payton in the Tradesman.

Damascus Tempering.

A manuscript lately discovered gives in detail the method employed in making the famous Damascus blades. The manner of tempering is something almost too horrible to relate: "Let the high dignitary furnish an Ethiop of fair frame," the description runs, "and let him be bound down, shoulders upward, upon the block of the god Balhal, his arms fastened underneath with thongs; a strap of goat skin over his back and wound twice around the block; his feet close together, lashed to a dowel of wood, and his head and neck projecting over and beyond the block. Then let the master workman, having cold hammered the blade to a smooth and thin edge, thrust it into the fire of cedar wood coals, in and out, the while reciting the prayer to the god Bal-hal, until the steel be of the color of the red of the rising sun when he comes up over the desert toward the east; and then with a quick motion pass the same from the heel thereof to the point six times through the most fleshy portion of the slave's back and thighs, when it shall have become the color of the purple of the king. Then, if with one swing and one stroke of the right arm of the master workman it sever the head of the slave from his body and display not a nick nor crack along the edge, and the blade may be bent round about the body of a man and break not, it shall be accepted as a perfect weapon, sacred to the service of the god Balhal, and the owner thereof may thrust it into a scabbard of ass's skin, brazen with brass, and hung to a girdle of camel's wool dyed in the royal purple."—Blacksmith and Wheelwright.

Another Serious Blow to the Steam Engine.

With cruel "sarkazzum" the *American Machinist* says:

A number of imaginative persons are looking eagerly forward to the near future when, it is asserted, a certain vibrating device is to thrust aside our old and reliable friend, the steam engine, as a general agent for the development of power.

The invention, which, to quote the bulletins, "consists of the core of a steam engine and the core of a dynamo," is to develop far greater power per pound of fuel than even the best of our present engines, and is to save thirty-five per cent in initial mechanical friction, fifteen per cent in outside connection losses, and where electricity is to be produced, an added trifle of ten per cent for conversion, or a total of not less than sixty per cent over present practice.

Last, but not least, the improved motor is to occupy but a trifling space, the machine for a fair sized ocean steamer being stowable within an ordinary silk hat of the dimensions worn by, say, one of our vindicated police justices; and such being the case, the regular greyhounds can carry power enough to make the ocean passage in a couple of days at most.

Just what connection is to be made between the vibrator and the screw, or other shafting, does not appear.

Possibly it is considered that such a trifling problem requires no particular consideration from those who soar above the clouds in scientific contemplation, and who usually leave the unpoetic practical designer to wrestle alone with the questions that arise in forcing the coarse materials of nature to conform to the requirements of geniustic theory.

It is hardly probable that the new device will very greatly interfere with the coming spring trade in the regular type of steam machinery.

"Among the November boiler explosions," says the *Locomotive*, "we note one that is particularly distressing. The gentleman owning the plant, whom we will call Mr. Brown, had been repeatedly solicited to insure his boiler, but had steadily declined to do so. He had a good engineer, he said, and a good boiler, and he didn't need insurance. Once, when our agent visited him, he was a little petulant, and his conversation was, perhaps, more emphatic than polite. But within a week from that day his boiler blew up and destroyed the entire plant. He felt differently about the insurance after that; but when he had rebuilt his mill and saw everything running in good shape once more, he changed his mind again and said 'Lightning never strikes twice in the same place.' Last month the new boiler exploded, with disastrous results, and Mr. Brown was himself among the killed."

At the time the Pennsylvania company placed its recent 30,000-ton order for steel rails, at $22, it was believed that the lowest possible figure was reached, and that the mills would lose money on the contract. The *Wall Street News*, however, has found "one of the most prominent iron workers of Pittsburg," who says that the mills could have taken the order at $20, and made money on it. In the interview, the gentleman said: "Present prices will rule until July, I think, unless Tom Johnson completes his plant at Lorain, Ohio, and jumps into the market. He will pull rails down to $18. We have been doing a great deal of work for him, and his place is nearly done. He will have a magnificent plant—one of the largest in the country."

Earnings of Labor in 1890.

Some idea of the enormous interest of laborers and mechanics in this country's commerce is shown by the remarks of the Governor of Ohio, at the recent meeting of the National Association of Manufacturers in Cincinnati. "Do you know the amount of wages paid to the labor of this country in 1890 (the last census year)?" said Mr. McKinley. "The stupendous sum of $1,221,170,454, or $3,914,000 to each working day, or $391,400 for every working hour of every working day in that busy year.

"As showing the advance of our manufactures, we had exactly 950,000 more persons employed in the year 1890 than in 1880, and more in 1892 than in either period, and the aggregate of wages of 1892 was more than double the amount paid in 1880. No people of any other country ever had so large a share in so great a product as the working people of the United States then enjoyed. The value of the product of our manufactures in 1890 was more than 100 per cent greater than those of 1890. When the manufacturers in 1890 were prosperous the wage earners were equally prosperous; agriculture was profitable; railroads were actively employed, and merchants were doing a satisfactory business. Why, in 1891, the amount of the deposits in the savings banks of the country was $1,623,079,749, and it is estimated that ninety per cent of these deposits were the earnings of our wage earners received from our home manufacturers."

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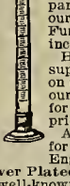
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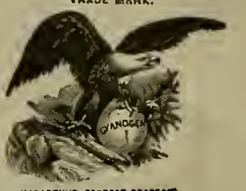

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

CHICAGO GOLD MINING SYNDICATE.—*Republican:* At the old Bunker Hill and Original Amador claims, near Amador City, operated by the Chicago Gold Miniug Syndicate, the wages aud other liabilities have got ahead of the premises. It has heen arranged that the proceeds of the mines, as well as the remittances from the East, should he divided pro rata among all the creditors. Under this arrangement, the work is now proceeding.

THE BEN HUR.—Hydraulicking at the Ben Hur placer claim at Pine Grove is in full blast. This was formerly known as the Wheeler claim, and, according to all accounts, it promises to have a long aud prosperous run. The auriferous ground is sufficient to last for many years.

ANITA.—At this mine sinking is progressing at a satisfactory rate. Last week they put in four sets of timbers, lowering the shaft 20 feet. The formation is slate, near the footwall, and is excellent working ground. The new hoisting works ruu smoothly. The shaft is now 120 feet deep. The water is troublesome, especially since the heavy rains of the past few days; hut the machinery is ahle to handle it without seriously interferiug with the sinking.

THE MEDIAN MINE.—*Record:* At the Mediau mine, Johu R. Tregloan, superintendent, a tramway is just finished which takes the ore from that miue to the mill of the South Spring Hill mine. Heretofore it cost the company ahout 80 ceuts per ton to get the ore to the mill. With the fiuishing of the new tramway the cost is less than eight cents per ton.

DRYTOWN DISTRICT.

THE GOVER.—*Ledger:* The lieu holders' cases against the Gover Mining Company have heen continued to March 4th. W. J. McGee, attorney for the company, says that negotiatious are still pending for the sale of the property, and if the sale can be affected, all the creditors will he paid in full. Jasper McDonald of the Keystone Company is still keepiug the water out of the Gover under his option of purchase, which has not yet expired.

JACKSON DISTRICT.

THE ZEILA.—The Zeila chlorination works have heen running ever since the mine and mill shut down on sulphurets on haud, hut the supply has all heen chlorinated and the works have shut down until the mill is again running.

Calaveras.

THE HEXTER MINE SOLD.—*Chronicle:* The Hexter mine, situated half-way hetween Mokelumne Hill and Middle Bar, has heen sold to Col. W. T. Rohinson, who has already commenced the work of prospecting for an ore body. Some thirty years ago this property was worked with a five-stamp mill. Exceedingly rich quartz was taken from the mine, hut, for causes unknown, the mill was removed from the miue, and for many years the property has heen idle. It is the opinion of Col. Robinson, who has carefully examined the property, that the original owners went through the apex of the ore shoot and then drifted the opposite way from the pay ore, and not finding any more good quartz they supposed the mine was played out. This is only one of many paying mines that were ahandoued hy mine operators thirty years ago, suhsequently to he opened and made to pay divideuds. The Kennedy mine of Jacksou and many others could he cited to hack up this statement.

The Hexter miue is situated hetween Mokelumne and Campo Seco canal, aud water under a 200-foot pressure can he had for the purpose of running all machinery necessary for cheap and economical working. The couuty road passes over the lode, so it is at once accessihle for large teams. The formation is porphyry on the hanging-wall and diahase and greenstone on the footwall. The fissure is five feet wide and chiefly filled with quartz carrying a small per cent of sulphurets and a record of $20 per ton in free gold. It is to he hoped that the future workings may develop a paying property, aud once more demonstrate to the miner of to-day that old ahandoned mines are worthy of his investigation.

CHANGED HANDS.—*Chronicle:* The Birney miue has virtually heen sold to Colonel Woodrow and other capitalists of Salt Lake City. Colonel Woodrow is uow en route to the Mormon city, and as soon as he arrives there he will probahly forward the money for the first payment, although he has until the 1st of April in which to do this. The deed to the property has heen made out and placed in escrow with Wells, Fargo & Co. until such a time as the second payment is made, the purchasers having six months from the 1st of April in which to make it.

The principal creditors of the Biruey Compauy held a meeting Wednesday evening and agreed to accept one-third of their claims when Col. Woodrow makes the first payment, and the halance when the second paymeut is made. The Colonel will reach his destination on the 21st inst., and expects to forward the money immediately. He is a wealthy mining expert and there is no douht ahout his sincerity in the matter. Like all others who have examined the Birney, he considers it a very valuahle property. His personal representative, Mr. McCreight, remained here to take charge of the property as soon as the first installment arrives.

The negotiations for the sale were conducted hy W. H. Routledge, who had an option on the property, on hehalf of the Birney Company, and J. T. Wall and Mr. McCreight on behalf of the Salt Lake City men. The transfer of the mine will prove heneficial to Angels, as it will he developed on an extensive scale and there will he ample means with which to prosecute the work.

The Missouri mine at Carson Hill has also heen sold to the Salt Lake City parties for $10,000, the payments to he made on the same hasis as those for the Birney. The property helonged to Joseph Peirano and Domingo Rolleri.

We uuderstand that Mr. Routledge has a hond on the Raspherry property and is negotiating for its sale.

Reports come to us of improvements heing made in the mill at the Mosser mine, near Mokelumne Hill, and also of the huilding of new hoisting works on the shaft. People residing in that locality have great faith in the future of the Mosser mine. It is a continuation of the old Lamphere lead.

THE BOSTON MINE.—*Chronicle:* The Boston mine, situated near Mokelumne Hill, and owned hy Louis Davidson & Co., will shortly he re-opened.

Del Norte.

AN OFFER REFUSED.—*Record:* Work on the ditch heing huilt hy the Del Norte Mining, Milling and Irrigation Company in the Big Flat country is progressiug rapidly. It is now thought hy those interested that the water can he hrought on the claims at an expense considerahly less thau was first estimated. The company has received an offer of $3000 for their property, from a Chicago man, which they refused. The memhers of the company will develop the mines themselves, and helieve when water is put on the claim they will have a honanza.

El Dorado.

GRAND VICTORY MINE. — *Republican:* The Grand Victory mine is the scene of active operatious at present. The mill is heing enlarged to a capacity of fifty stamps, and three rock hreakers are at work reducing ore from the mine to a size adapted for work hy the stamps. It is said that a recent discovery has heen made of ore mueh hetter than any hitherto worked.

Inyo.

MARBLE QUARRY. — C. B. Derhy is uow superintendent of the Inyo marhle quarry. The *Index* says the shipmeut of marhle will soon he resumed, and a numher of additional men have heeu put to work.

Mariposa.

GENERAL MINING NOTES.—*Gazette:* The mau who recently bonded the Daisy, Juhilee and Steveson quartz mine north of the river, has men at work, aud from the Daisy aud Juhilee comes news of the finding of an exceptionally rich hody of gold ore in each.

The work of the Sierra-Butte compauy at the Whitlock mine is progressing favorahly. The fine three-compartment shaft is now down over two hundred feet, and seventy-five men are employed in and arouud the mine. The first consignment of machinery for the 50-stamp mill arrived this week and is heing placed in positiou. The carpenter work on the mill and other huildings is heing forwarded as fast as circumstances will permit.

Several loads of mining supplies, track iron, ore cars, pipe, tools, etc., for the Heaton mine in Devil's Gulch, have heen sent up this week. Mr. Chapman has a uumher of men at work and is pushing things.

The grant people have the tunnels and drifts on the Pine Tree mine nearly all cleaned out, and now have a similar work in view on the Princeton mine, hoth old-time honanza properties.

Mono.

A REPORTED STRIKE.—It is reported that a strike has heen made in the Standard mine at Bodie, Cal., running through the Jupiter into Bodie ground, says the Virginia City *Enterprise.*

Nevada.

MINE BONDED.—*Tidings:* Prof. Geo. A. Treadwell has taken a hond on the Fountain Head gravel mine, in this district, and will endeavor to raise a working capital in England for the exploitatiou of the property. He will form an English company and raise sufficient working capital, in the heginning, to fully develop the claim, so that the stock will he unassessahle. This is in accordance with English law, as in that country assessments cannot he levied upon the stock of a corporation.

WILLOW VALLEY DISTRICT.

Herald: Considerahle prospecting is heing done. Several claims have heen honded and leased, and companies are heing organized to work them.

The Alice Belle, at which the Murchie company is doing its principal work, is progressing rapidly and giving up good ore.

The company now works three shifts in the old Murchie drain tunnel. The little four-stamp mill has plenty of rock to work on now.

At the Belle Fontaine work goes steadily on, and the ore taken out is high grade.

The Federal Loan is said to he in excellent ore still. It was, no douht, the success of the Federal Loan that stimulated mining in that district.

NEW MINING COMPANY.—The Cadmus Mining Company is soon to he incorporated, and will immediately commence the erection of hoisting works and hegin developing the claim. This is the McHugh location, adjoining the Home and Providence on the west. Charles Kaehle, formerly a foreman at the Providence, is to he superintendent.

Shasta.

TROUBLE AT QUARTZ HILL.—*Free Press:* The Kosciusco mine, at Quartz hill, is owned hy a Polish company, and the stockholders or directors are having trouhle among themselves. The company has expended ahout $90,000 on the mine so far and the ore has paid fairly well hy the common mill process. No douht, however, a percentage, and perhaps a large percentage, of the gold has escaped. Anyhow, from this or some other eause, there has heen and is trouhle. Recently a Polish priest and the secretary of the company arrived from the East, and there is an effort heing made to patch up a peace.

A GROWING DEMAND.—Redding *Free Press:* There seems to he a growing demand in Shasta county for mining properties, which ought certainly he encouraging to our poor mine owners, and spur them on in the development of their miues. Show the capitalist that you have something to sell, and there will he little trouhle in disposing of your property. The recent sale of the Iron Mountain mine for $300,000 will increase the demand for development properties.

San Diego.

BANNER DISTRICT.

NEW GOLD DISCOVERY.—A new gold discovery is reported east of Banner. The ore shows free gold and prospects well. Bacon & Coffman's mine is reported very rich, and the ledge maintains its width as the shaft is pushed down.

Sierra.

DANGEROUS AT PRESENT. — *Messenger:* The contractors who are running the tunnel at the Slug Canyon mine have heen unable to work the most of the week. Slug canyon is one solid mass of snow slides and it is dangerous for men to go up to the mine.

Placer.

THE GEM MINE.—*Sentinel:* Work at the Gem mine at Humhug is heiug pushed. The lower tunnel is iu ahout 200 feet and the upper tuunel not quite that distance. The miue is excellently situated for the huilding of a mill; and if the ledge proves to he what is expected from previous prospectiug, a large mill will go up ou the site. The ledge is only a few miles from the famous Pioneer, which is paying hetter now than at any time previously.

Tuolumne.

THE GOLDEN RULE.—*Independent:* On Tuesday, two-thirds of the Goldeu Rule quartz mine was sold to a San Francisco syndicate, hy the owner, Mr. McGinn—Mr. O. S. Cressy retaining the other third of the claim. The whole property heing valued at $100,000, the two-thirds was sold at that rate of valuation. The Golden Rule is located ahout one mile south of Quartz Mountain, and hids fair to hecome one of the most noted in Tuolumne.

NEVADA.

Storey.

THE COMSTOCK MINES.—At present, says Dan De Quille, most of the ore that is heing milled hy the Con. Cal. & Virginia Company is heing taken from the new hody of ore recently discovered to the southward on the 1650 level. Though this is good milling ore, it is not so rich as that in the main chimney through which the incline was sunk. During the past week the mill worked 175 tons of the new ore, the yield of which was $37.60 a ton. Thus it will he seen that the new hody was not a had find. In the new deposit an opening has heen made that is now fifteen feet loug and twelve feet wide.

The Hale & Norcross is yielding some ore, hut most of the work is exploratory. On the 975 level a small streak of oro was passed through in a crosscut, from which were taken six cars of ore that averaged $47.88 a ton. This is a very promising prospect.

The Alta is hecoming a steady producer. The yield last week was 124 cars of ore, worth $43.28 a ton.

The Crown Point is yielding nearly 600 tons a week of gold quartz, which averages over $9 a ton.

Both the Belcher and the Seg. Belcher are now heginning to yield small lots of fair-grade ore, which is quite encouraging.

The Potosi, Chollar and Occidental are yielding ahout as usual.

To the west of the main line of the croppings of the Comstock lode lies a region that is unexplored. Though immense sums have heen expended in prospecting to the north and south along the course of the Comstock, no work worthy of the name has ever heen done to the westward. Many large veins crop out in the unexplored western country, most of which yield good prospects in gold, hut on none of these has anything hut surface scratching heen done. It seems strange that this promising section should have heen allowed to lie unprospected for over thirty-five years, yet such is the fact. All the time, too, our oldest and hest miners have thought well of this region, hut the majority have heen afraid of the water it is supposed to contain. It is supposed that a great hody of water is held hack hehind the footwall of the Comstock lode. Some accidental tappings indicate that this is probahly the case, hut any water found would now he easily disposed of hy sending it out through the Sutro drain tunnel.

In this way the west country could he cheaply drained to the depth of over 1600 feet. At last one company is pushing out into this undeveloped seetion. This is the West Con. Virginia & California Company. They are running west from the 1100 level of the honanza mines, and, after passing through much hard and solid rock in the footwall of the Comstock lode, seem to he entering the confines of the west country. They have tapped quite a heavy flow of hot water, which shows a change of formation uear at hand. The hot water at the face of the drift caused a suspension of work, hut the flow is gradually decreasing. As the flow diminishes the water hecomes cooler, and soon work may he resumed in the drift. It is thought that some development of interest will soon he made in this drift. It is the first venture at depth into the west country, and hy means of it a discovery may he made that will give the Comstock a new lease of life, if not a rousing hoom. The hot water is a sure sign of ore, or at least vein material, somewhere ahead.

Lyon.

SILVER CITY NOTES.—*Times:* A. A. Pollard is having a new flume huilt from his reservoir in American canyon to the Pollard mill.

Everyhody is working—some on leases and some ou their own claims—and all are meeting with suceess.

All of the old mines are looking well, particularly the Oest, Haywood, Great Western, Succor, Overland and Brodek.

There are three mills now running—the Pollard, Foot and French. The others will start up very soou if good weather continues.

There is a large amount of ore out at the different dumps awaitiug hauling to the mills. It will he hauled as soon as the roads are in a condition for teams to move.

MILL FOR PINE NUT.—Genoa *Courier:* The San Francisco parties who hecame interested in the Zirn & Schultz claims will hegin the erection of a mill on or hefore the 1st of May, and have agreed to have it completed and running hy the 1st of August. The mill is to he of sufficient capacity to crush from twenty to forty tons a day, according to the character of the rock. These parties have also agreed to procure a supply of water for the camp. The water will have to he piped a distance of five miles. The total outlay for these improvements, it is estimated, will be not less than $10,000.

ARIZONA.

THE VULTURE TAILINGS. — *Courier:* The Helm Bros., now operating on the old Vulture tailings, are completing the erection of cyanide tanks, which process, it is said, is perfectly adapted to successfully handle this product. There are many huudreds of tons of these tailings which have lain idle for over twenty-five years; and, strange as it may appear, no interest was taken in the reducing them to metal until these mining men commenced to determine their real value. These tailings will run ahout $15 per ton; and from the cheapness of the method adopted to handle them, a fortune will he made hy it, so many miners say who have recently heen there.

GOLDFIELD NOTES.—Phœnix *Herald:* At the Mammoth mine, no ore is heing taken out at present. The main shaft has heen sunk 350 feet, at which point drifts are heing run to tap the veiu. Everything is in readiness, and it is said active operations will he resumed soon, and ore will he takeu out and the mill started up.

Some new and exceedingly rich ore has been struck on the Bull Dog property, which is heing thoroughly developed. The Pomeroy mill is workiug steadily on the 150 tons of ore from this property, and the plates show that the ore will average at least $25 per ton. This property is owned hy Phœnix people, who have already expended about $12,000 and who now see their way clear to a good-sized fortune.

The Fairstake and Sunset properties are heing worked and show up finely. A sensational story is promised regarding these claims in the near future.

H. J. Allen, of Jerome, said the report of the recent cave in the United Verde Copper Co.'s mines was a most cavernous fahrication, or words to that effect.

IN COPPER BASIN. — Tombstone *Epitaph:* Four men with two teams are at work in Copper Basin ground sluicing, and are said to be taking out $10 each per day of clean-looking gold dust. Another man was seen at work in the same locality with a rocker. He stated that he was making a good liviug.

BRITISH COLUMBIA.

QUARRIED OUT.—*Midway Advance:* A visitor to Fairview at the present time can see one of the greatest "snaps" in quartz mining to be seen anywhere. The quartz is heing literally quarried out hy four men, who manage to keep the ten-stamp mill supplied with ore.

COLORADO.

SOME COLORADO PRODUCERS.—*Ores and Metals:* The Golden Wedge, near Central, returned on 1,709 pounds of first class ore, 34.69 ozs. gold, 16.4 ozs. silver, and 15 per cent copper per ton, total commercial value $668.68. 4,675 pounds of second class ore gave 6.40 ozs. gold, 6 1-5 ozs. silver, and 7¼ per cent copper per ton, value $117.84 per ton.

The Mollie Gihson, the world's famous silver producer, will pay no dividend this month. Last month's receipts were only $20,000, barely enough to pay expenses. The mine is now in 40-ounce ore, which is a very low grade for the Mollie, hut it is confidently expected that rich ore will he found again soon.

The North Star mine on Sultan Mountain, Col., has an almost phenomenal record in that it has not heen shut down a day in eleven years. During that time it has shipped 25,000 tons of ore, and 5,000 tons of concentrates, which produced 2,000,000 ounces of silver, 108,000 ounces of gold, and 8,000 tons of lead. The average value of the ore in gold, silver, lead and copper is $62 a ton.

The Star mine at Ward, equipped ouly with rattletrap machinery, with not a drift helow 300 feet, is shipping daily a carload of ore worth $2,000. The Giles, another mine, keeps every availahle stamp in town steadily pounding; the Utica has 16 feet of ore running into the hundreds; the Modoc and Humholdt are each pounding out 50 tons a day, with good returns, while the great Columhia out-cripples Cripple Creek, with its daily output reaching toward $2,000—$60,000 a month. But they say there's a bigger mine thau this near Ward—the Dew Drop, over in California gulch. The operators of the Columhia say it themselves and they are in position to know.

Custer Co.

THE GEYSER MINE.—*Silver Cliff Rustler:* The Geyser mine is hetter than ever. A new mineral known as prousite has heen fouud. It is a crystallized ruhy silver and assays 16,000 ounces silver per tou. Late assays have shown as much as $86 in gold, and 21 assays made from the 2,100-foot level gave an average of 4,500 ounces in silver.

Mineral Co.

IN CREEDE DIST.—*Creede Candle:* At least 800 men are employed in and ahout the mines in this district. The pay roll for the last month is the largest since the slump in silver, and the force on several properties is con

stantly being increased. With the opening of spring at least 1,000 men will find employment in and around Creede camp.

IDAHO.

SOLD FOR $30,000.—The Salmon City *Recorder* learns that the Hughes Creek placer property, near Gibbonsville, has been sold to St. Paul capitalists for $30,000, a small sum being paid now and the balance to be made in regular payments within a year. This property was owned by Messrs. Fahey, Huat, Stein and others of Gibbonsville.

THE TIP-TOP.—Silver City *Avalanche:* The mill has started up again with forty stamps, and will be run steadily on half time (twelve hours). Forty tons per day can be treated in this manner, and it is impossible to keep ore at the mill when running its full capacity. Shelton & Eastwood, ore haulers, have about two hundred tons at the mill, and are hauling steadily with five teams.

World: Superintendent Wood of the Cumas No. 2 mine and mill came to town to-day bringing a gold brick that weighed exactly seventeen and a half pounds. At $16 per ounce troy the brick is worth about $4,000. This was the result of 15 days' run of 15 stamps.

Another brick worth about $1,500 having been brought in a couple of weeks ago, this makes about $5,500 worth of bullion brought in. A clean-up is now going on at the mill, which will doubtless result in $1,500 worth of gold additional.

In addition to the gold 60 tons of concentrates have been shipped since the mill started up. These are worth $80 per ton, and amount to $4,800.

We thus have a total of about $12,000 for about 25 days' run of 15 stamps.

Mr. Wood says that during that time he ran 500 tons of ore through the mill.

His expenses average $100 per day.

He expects to do much better the current month than he did last, especially as he will run 20 stamps instead of 15.

FAVORABLE INDICATIONS.—Weiser *Signal:* The prospects are that mining operations in Warrens the coming season will be more extensive than for many years. The number of heavy mining operators who are turning their attention to the camp bespeaks a leading position in the mining world. This is well for Warrens and well for Weiser.

LOWER CALIFORNIA.

AN AWAKENING.—*Lower Californian:* The revival of mining interests in California and the renewed impetus in that great industry, which for years has been sadly neglected, is already having its effect upon Lower California. Mining men are again awakening to the fact that there are rich mineral deposits throughout the length and breadth of this great peninsula, much of which is even unexplored. The prosperous condition of the Iharra Mining Company at Calmihi is apparent, and they are now employing some 300 men and expanding their facilities with improved machinery. In this section several mines are in profitable operation, and everything indicates a revival in mining interests. That the gold is here is self-evident, and pluck and capital are only necessary to open up many mines now lying idle and to put them on a good paying basis.

CEDROS ISLAND MINES.—H. A. Howard, representing Eastern capitalists, on the 5th inst. purchased a controlling interest of fifty-one shares in the Cedros Island Mining and Milling Company, and was installed again as general manager of the company. Mr. Howard says the deal means the immediate reopening of the work on the mines and the shipment of ore. During his management of the properties some years ago, the mines yielded a large amount of ore, much of which was handled through the port of San Diego. The new investors are also interested in Mr. Howard's gold mines at Jacalitos, on the peninsula, and machinery will be shipped there for development of the prospects.

MONTANA.

SEEKING INVESTMENT AND OCCUPATION.—Butte *Mining Review:* There are many strangers in town—mining experts, mill men, contractors, miners and speculators—all of whom are actively seeking investment or occupation in their various lines. The mines about here are improving and the mineral output increasing, and the time is shortcoming when mining matters will be pushed forward with vigor.

NEW MEXICO.

Grant Co.

WHITE SIGNAL.—*Enterprise:* The new strike in this district is a porphyritic-syenitic ledge, varying from five to seven feet in width, and, it is claimed, assays ranging from $5 to $45 per ton have been obtained.

This comparatively new gold mining district began its production and shipment of gold ore less than a year ago. To-day a fifty-ton mill is in course of erection, and will be in operation within forty days. John Brockman and company are putting in a Jannisch mill which will crush fifty tons of ore per day. The company have purchased several mines and have sufficient ore exposed on their own ground to keep the mill running.

PINOS ALTOS.—Spiller and McLean are working eighteen men on the Pacific Gold Company's claim, the Pacific. The ore is hauled to the company's mill, north of Silver City, for reduction.

OREGON.

THE ASHLAND MINE.—*Tidings:* The miners and other creditors of the Ashland mine, which has not been managed to suit many of them for some time past, have been in Ashland consulting, and it is understood that a number of additional liens against the property will be filed at once and Judge Hanna petitioned to appoint a receiver for the property. The mine is advertised to be sold upon execution on the 23d, but it is not likely that the sale will take place. The mine was never in a more promising condition, it is said, as far as showing up good paying rock is concerned.

Jackson Co.

The San Francisco parties who had the Mountain Lion mine, on Missouri flat, bonded, have given it up and Bailey Bros. are again in possession.

The Hammersly mine is gradually bringing its owners out of deep water. The mine has already cleared off some $13,000 indebtedness, and is only partly opened as yet.

Jeanie Bros., who have purchased the placer claims of Keuney, Bonson and Anderson, on Sardine creek, have put in two giants with eleven-inch pipe, and expect to make a good showing during the season.

UTAH.

ANOTHER GOLD MINE.—The Bullion-Beck places itself on record as a gold mine, a rich strike having just been made on the 700-foot level. It is the first time gold in paying quantities has been discovered in the Beck, all of the previous assays showing simply traces of the yellow metal. The body of ore just uncovered shows average returns of $40 in gold, over 100 ounces of silver and the usual amount of lead and copper. Members of the directory report it as making a splendid showing and increasing in magnitude with every foot of development work. The presence of gold in such quantities in the lower workings of the property is a most encouraging sign and indicates that the richest portions of the mine have not yet been reached. Some shipments of ore from the new deposit are to be made at once. It is stated that the property never looked better in its history, and, with 112 men on the payroll, the output of ores is extremely heavy.

Camp Floyd District.

THE EAGLE COMPANY.—*Tribune:* The Eagle Gold Mining Company, with a capital stock of $150,000, and as many shares of a par value of $1 each, yesterday filed articles of incorporation, which recite that it is the intention of the incorporators to proceed at once with the exploration and development of a group of claims situated in Camp Floyd mining district, and consisting of the American Eagle, Bald Eagle, Eagle's Nest and Gray Eagle. The board of directors and officers consist of C. C. Goodwin, president; Edward E. Clark, vice-president; W. E. Huhhard, secretary and treasurer, and George L. Korner.

WASHINGTON.

OKANOGAN WILL MAKE THINGS HUM.—*Outlook:* Supt. Wheeler of the Bridgeport Mining and Milling Company, who went East last fall to raise money for mining purposes, has written back that he will return the 1st of April prepared to "make things hum" on Mineral Hill. This is good news, as the resumption of operations on the promising group of mines owned by that company will undoubtedly encourage other companies to move in the same direction.

WON FROM THE SAND.—Chelan *Leader:* Gold in paying quantities has been taken from the Columbia river sand on the Abercrombie bar above LaChapelle's by the use of the gold-saving machine invented by his brother, J. Porter Nicols, and we were shown the results of two cleanups, one of five hours, bringing $50, and the other of three hours, showing about $25.

WYOMING.

Laramie *Times:* There is considerable excitement at the Big Laramie, Wyoming, placer fields over a big strike that was made a few days ago. A prospect hole was sunk on one of the claims belonging to the Dodge City Placer Company to bedrock. They panned out from 75 cents to $1 per pan. The gold is different from any other that has been panned since the discovery in the camp, all of it being round or block pieces. In fact, it is the only place where bedrock has been struck, and it pans out beyond all expectations. If the weather continues to be pleasant, the Iron Mountain Company will send a gang of men there to work on its claims, preparatory to putting in a $30,000 plant.

W. H. Birch & Co. (Incorporated)
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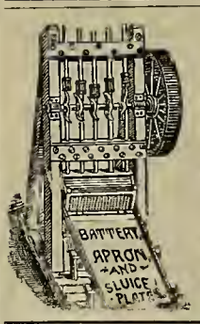

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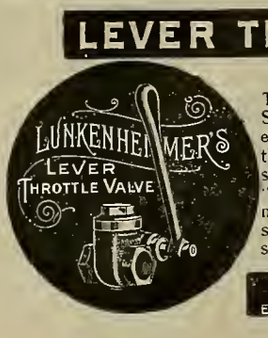

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Electrical Progress.

A Kansas City Electric Carriage.

A recent dispatch from Kausas City, Mo., said that a horseless carriage weut skimming along the smooth asphalt of Fonrteenth street in the vicinity of Cherry street, fulfilling Mother Shipton's prophecy that "Carriages without horses shall ruu," and terrifying two negroes, who saw sparks, and, apparently, sulphurous flames issuing from under it.

The vehicle was an electric carriage, of Kansas City invention and mauufactnre, and is the only one of its kind in the United States. There are several electrical carriages in New York city. The machine worked perfectly. A speed of eleven miles an hour was obtained.

The carriage is about the size of au ordinary vehicle. One seat faces the front and another one faces to the rear. A storage battery, composed of five series of five cells each, furnishes a current of sixty-seveu and one half ohms, and the cells are arranged in three tiers beneath the seats. The wheels are of wood, with India rubber cushious on the tires. The hind wheels, which are three feet two inches in diameter, have ou their inner sides a cast-iron flauge twenty-six inches in diameter and five inches wide. Power from the batteries is commuuicated to the flauge by a rawhide friction pulley, revolving from six hundred to one thousand times a miuute, and is capable of being elevated or depressed at will by the driver by means of divers, on which he places his feet. The steering is done by a tooth segment and attached to the axle of the fore wheels aud handled by a steering post, manipulated by the driver with his hands. The carriage can make quick, short turns. The storage batteries will run the machine about seven or eight hours. The carriage weighs about two thousand pounds, and is quicker and lighter thau the Europeau coaches.

A Tremendous Light.

The idea of an electric light which, fed by a current from a dynamo actuated by a forty-horse power engine, and giving 7000-candle power, can have its illuminating power intensified 35,000 times, is not easy to grasp. It means the production of a stream of light of about 250,000,000-candle power, and it is no wonder that the announcement that such a light is about to be used iu this country has been received with some incredulity in Europe. Yet, says the *Press*, this is the efficiency of the light which will be shortly erected at Fire Island for the illumination of the adjacent coast aud the protection of the fleet of ships eutering New York harbor. A remote suggestion of the power of this lamp may be arrived at by bearing in mind that an ordinary oil lamp is about 38 or 40-candle power, and then trying to imagine the combined beam of 3,000,000 lamps. The ordinary electric street light may be put down at 100-candle power, and 250,000 of these would about represent the strength of the Fire Island light.

The most powerful oil lamp yet made is supposed to shine out on a clear night for a distance of 35 or 40 miles, but the new light will flash its welcome rays to the iucoming European liners when they are 120 miles away. The light revolves rapidly and throws ont its beams with the intensity of speed of lightning. The motive power which actuates it is a simple clockwork arrangement contained iu a box two feet square, aud although the revolving portion of the light weighs fifteen tons, the mechanism controlling it is so delicate that the pressure of two fingers will turn it. The value of this marvelous lamp can ouly be determined by practical working, but it promises to represent an immense stride in the science of coast lighthouse illumination.

In his address at the recent convention of the Northwestern Electrical Association in Milwaukee, Mr. C. E. Gregory, of Chicago, said: "As the electrical business takes on age we find ourselves very near to the plane upon which we find the iron and woodworking industries. There was a time wheu we paid $100 for a series arc lamp, $800 a thousaud for carbons, and charged $1 per uight for commercial arc lights. We were then nursing the infant, but we have now on hand a giant who requires at least $600,000,000 per annum for supplies and expenses."

The Walker-Wilkins voltaic battery comprises a split cylinder of amalgamated zinc immersed in a solution of caustic potash contained iu a porous pot. This pot is placed iuside a cylindrical vessel having very numerous holes perforated through its wall. The iutervening space between the porous pot and the containiug vessel is packed with granulated carbon, that nearest the porous pot being powdered, and that nearest the perforated containing vessel in larger pieces. The current is collected by a perforated sheet nickel cylinder imbedded in the granular carbon. This cell has been tested by Professor Andrew Jamiesou, who reports that it is the best of its kind he has ever tested. A two-pint cell, weighing nineteen pounds and measuring 14x8¼ inches gave 1.457 volt on open circuit, 1.324 volt when .467 ampere was flowing, and 1.264 volt when 1.346 ampere was flowing. The output of a cell was kept at 1.1 ampere by varyiug the resistance, and the potential difference fell from 1.173 volt to 1.015 volt in 226.5 hours. The cell was then allowed to rest, and the electromotive force measured every twenty minntes to test its power of recuperation. At the eud of one hour it gave 1.260 volt; at the eud of two hours, 1.285 volt; at threc hours, 1.318 volt. The mean internal resistance of the cells varied from .112 to .161 ohm.

Russia's Metal Resources.

The Glasgow *Herald* says: "In the province of Daghestan, in the Russian Caucasus, rich deposits of quicksilver have recently been discovered, extending almost throughout the district of Kjnrinsk. The mercury is found imbedded in large sandstone blocks, and is of great purity. In different parts of the district other metals—such as lead, zinc, copper, sulphur and cobalt—have been met with, and the uatives have found at various placcs saud containiug a large perceutage of gold and a kind of yellow enamel color. Samples of these minerals have been sent to St. Petersburg for analysis. Russia also coutains about ten districts, mostly situate in the Ural mountains, where the gold-washers fiud diamouds every now aud then. The Ministry of Agriculture have sent to the Cape of Good Hope for the supply of thirty-nine crude diamonds in the matrix, it being assnmed that if the miners knew how the crude stones look diamond finds would be much more numerous."

The man who deliberately takes work below cost for the sake of handling money is dishouest, and he who does the same through ignorance may be forgiven for the first offense; but if he canuot help making such a mistake a second time he should get out of business. Dnring the dull times through which we have been passing I can quite understand how a man might be tempted to estimate low for the purpose of keeping things moving. The great trouble of this practice, however, is that customers will want these low prices contiuued wheu times get better and presses are needed for more profitable work. Cutting prices is easy, but restoring them is a harder matter, even if it can be accomplished at all.—American Bookmaker.

The most exteusive salt mincs in the world are located at Wieliczka, nine miles from Cracow, an Austrian city, in the crowu land of Galicia. These mines are worked on four different levels and have a total length of forty to fifty miles.

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IT has beeu considered by the medical professlon that hernia—commonly called rupture—was iucurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patieut no pain, and those living near enough do not lose auy time only while lu his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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Where Cash is Scarce.

Scene. A village blacksmith shop in Bergen county, N. J., up near the New York State line.

The village blacksmith and his helper have just finished their day's work. The latter stops to lock the shop, while the former proceeds homeward. He has disappeared around the corner, when he suddenly reappears, on the dead run. "Hi, there," he shouts. "Don't lock up yet! Wait a minute!"

"Forgot something?" asks the helper.

"Yes."

"What?"

"The safe."

"Oh!"

The brawny blacksmith enters the shop and soon returns with a long board on his shoulder. It is covered with chalk marks.

"What is that for?" I ask.

"My safe."

"Your what?"

"My safe."

I know him well, and I accompany him towards his home. On the way he explains.

He has shod and "sharpened," he and his helper, thirty-eight horses during the day. Been on the jump from early dawn until nightfall. Had work enough to keep him in the shop all night, but he needs rest. Now is the busy season. Cold weather always brings a rush. Horses must be shod and old shoes sharpened to guard against the slipperiness of the roads.

"You should grow wealthy," I venture. "How much do you charge per horse?"

"From $2 to $2.50 for the four shoes."

"According to that you have made in the neighborhood of a hundred dollars to-day."

"Yes," says he, "and it's all on that board. I chalk it there to save time and then transcribe it into my books when I get home."

"Nobody pay you?"

He looked startled.

"One man wanted to pay me," he said, "but it's Friday, and I was afraid to take the money. I didn't dare to break in on the monotony of the day's proceedings."

"Will they ever pay you?" I ask.

"Oh, I suppose so. Some are good, some bad. We take their word for it. Everybody does hereabouts."

I ascertained these assertions to be true by interviewing the tradesmen. One merchant showed me his books, which proved that he had $10,000 outstanding.

"I get it in driblets," said he. "In some cases I let the people work it out. In others I take butter, eggs, milk, etc., in part payment of the debt.

"Some of our people never think of paying for anything they get. When one tradesman shuts down on them they go to another, and thus run through the whole gamut. When they have exhausted their credit in this town they go to the next town, and so on. By the time they have run through all the adjoining towns the local merchants have been compelled to sell out, and the 'free traders' strike the newcomers and begin it all over again.

"There is very little money in circulation in any of these country towns," continued the speaker. "Some time ago I marked a ten-dollar note and got it changed at the store of one of my neighbors. The butcher, the baker, the saloonkeeper, and so on, brought that bill to me at frequent intervals for me to change. It remained in town for several months, and then I finally banked it. Blamed if it didn't come back even then. A citizen here paid it to me. He had received it in change in a New York clothing store. I have framed it now."

Market for American Woods.

Eugene Germain, United States consul at Zurich, has been collecting a mass of information from Swiss manufacturers, builders and shipwrights as to the possibilities for American woods in Switzerland, and this he has embodied in a report to the State Department, giving in great detail the needs of each trade, prices current and other facts, all tending to establish his conclusion that there is an excellent opening in that country for American woods, provided they are of the first quality. The consul gives the names of Swiss importing houses that would be willing to undertake this business upon commission, and thus displace the woods now received from Hungary, Germany and England.

WITHOUT the power of attaching other men to his interests, a foreman cannot successfully regulate his workshop. In such cases he comes to be regarded as a mere taskmaker—an enemy to be beaten rather than a friend to be assisted, and the employer suffers from his moral defects. The possession of the attribute named, above and beyond the practical skill and scientific requirements previously referred to, will, in ninety-nine cases out of the hundred, gain the friendship of the employer as well as of the work-people, and thus the life of the foreman will be made not only endurable, but happy. No sadder picture can be imagined than that of an unprincipled man intrusted with absolute power.—Jos. Newton.

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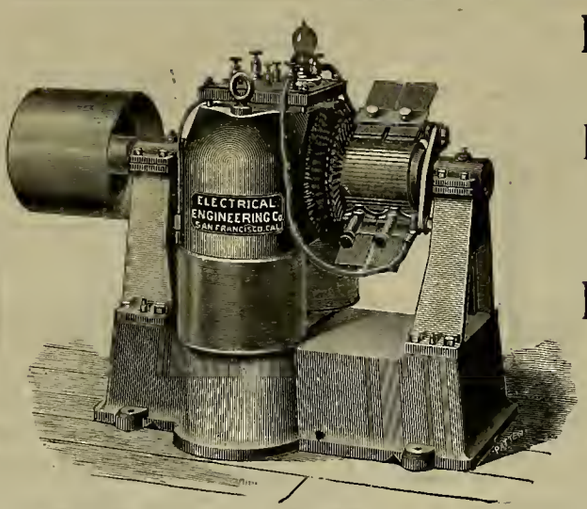

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Market Reports.

The Markets.

SAN FRANCISCO, Feb. 21, 1895.

Silver again passed heyond the 60 cent limit during the week, a dullness in the foreign copper market interfering with sales. During last month copper was so much cheaper in London than in New York, that one French company bought 1200 tons in the latter city. Lead is unchanged.

At last a premium is announced on gold—three-eighths of one per cent. This was on Monday, and was occasioned by the scarcity caused by the demand for the new U. S. bonds. The premium is not likely to be permanent.

New York Metal Market.

NEW YORK, Feb. 21.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.
COPPER—Brokers', 9¾c; exchange, 9.90c.
LEAD—Brokers', $3.02½; exchange, $3.10.
TIN—Straits, 13¾c; plates, ——c.
SPELTER—Domestic, $3.20.

New York Prices.

NEW YORK, Feh.21.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	27⅜	59½	9 75	3 02½
Saturday	27¼	59½	10 00	3 02½
Monday	27½	59⅝	.....	.....
Tuesday	27⅜	60⅜	.....	.....
Wednesday	27¾	60⅝	9 75	3 02
Thursday	27⅞	60½	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	5c
New York Telegraphic Transfer	7½c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.89
Refined Silver, per ounce	60½
Mexican Dollars, nominal	49@49½

San Francisco Metal and Coal Market.

ANTIMONY.			
₵lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	6 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
NAILS.			
Wire			$2 90
Cut			2 65
PIG TIN.			
Per lb	15	@	16 00
ZINC.			
Sheet	8¼@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do. " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL. SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			12 50
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	12 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'			75c ₱ bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER. SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, Feh. 21, 1895.

The stocks were stronger during the early part of the week, the demand exceeding the supply. On Wednesday prices fell off again, the shorts making the usual effort, despising not the day of small things.

For the first time since June, '89, the Eureka Con. levies an assessment. It used to he a good dividend producer, having paid ten dollars in dividends to one dollar it has ever assessed.

The remote prohahility of the Hale & Norcross mine getting some money from a judgment in one of the Fox suits gave the stock a lift early in the week. Work in the mine has been resumed.

At the annual meeting of the Standard Consolidated Mining Company of Bodie, last Monday, 76,641 shares of the capital stock were represented.

The following directors were elected: Thomas H. Leggett, William Borrowe, P. M. Lilienthal, A. P. Brayton and J. W. Pew of San Francisco, and W. H. Oscanyon and C. H. Badeau of New York.

During the past year the receipts of the Standard Consolidated, including balances carried over, aggregated $259,790.53; disbursements, $206,605.44, four quarterly dividends of ten cents each, amounting to $37,805.60 included; halance on hand, $53,185.09. Another quarterly dividend of ten cents per share was declared, payahle March 20th.

C. H. Fish, president Con. California & Virginia, is visiting the Comstock. It is expected when the new survey of the late workings is finished that an increase in the force in the mine will he made and active prospecting carried on.

D. C. Bates has been elected director of the Con. New York Mining Company, vice C. C. Harvey, deceased.

Superintendent Boyle of the Alta announces the shipment of hullion valued at $10,500, heing the cleanup of the recent run of the mill.

The directors of the National Lead Company declared a quarterly dividend of 1¾ per cent on the preferred stock, payahle March 15th.

Tbe following illustrates the changes of the week:

MINES.	14	21
Alpha	.....	$ 07
Alta Consolidated	$ 35	31
Andes	27	23
Belcher	39	40
Best & Belcher	72	77
Bodie	91	88
Bullion	10	08
Challenge	.....	.....
Chollar	50	50
Confidence	.....	.....
Consolidated California and Virginia	2 80	2 55
Consolidated New York	.....	.....
Crown Point	.....	42
Exchequer	.....	.....
Gould & Curry	28	44
Hale & Norcross	82	90
Justice	09	.....
Mexican	.....	74
Ophir	1 45	1 45
Overman	14	.....
Potosi	52	.....
Savage	40	41
Sierra Nevada	32	60
Union	45	42
Utah	.....	.....
Yellow Jacket	45	42

San Francisco Stock Board Sales.

SAN FRANCISCO, Feb. 21, 1895.

9:30 A. M. SESSION.

250 Alpha Con	07	100 Gould & Curry	44
300 Alta	31	500 Hale & Norcross	90
100 Belcher	37	100 Mexican	74
50 Benton Con	60	1000 Occidental	05
100 Best & Belcher	77	50 Ophir	1 45
300 Bodie	85	100 Savage	41
200 Chollar	50	100 Seg Belcher	07
150 C. C. V	2 55	60 Sierra Nevada	60
300 Crown Point	40	200 Yellow Jacket	42
20	42		

SECOND SESSION—2: 30 P. M.

400 Alpha Con	07	400 Con Cal & Va	2 45
300 Andes	23	120	2 50
100 Belcher	39	200 Crown Point	38
100	40	500 H & N	88
300 Best & Belcher	75	100 Mexican	73
100 Bodie	88	50	72
100 Bonanza	10	50 Ophir	1 40
200	15	100 Savage	39
150 Bullion	08	100 Seg Belcher	06
500 Chollar	49	200 Sierra Nevada	59
400	50	50 Union Con	42

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitore for Pacific Coast.

FOR WEEK ENDING FEBRUARY 12, 1895.

534,196.—AMALGAMATOR—A. & J. W. Carlson, Lagrande, Ogn.

533,870.—PIPE FASTENER—H. N. Davies, Rockford, Wash.

533,886.—STRAW BURNER—F. Girtanner, Los Angeles, Cal.

533,891.—SASH FASTENER—J. E. Hartmann, Tacoma, Wash.

533,901.—PLANT SUPPORT—J. E. Hutchinson, S. F.

534,119.—LATHE—Matthew & Collier, Tacoma, Wash.

534,226.—BILL FILE, ETC.—T. F. McGarry, Pasadena, Cal.

534,002.—BOILER—D. J. Perkins, Truckee, Cal.

534,014.—ANIMAL TRAP—J. Sherrett, Norfolk, Ogn.

24,041.—DESIGN—HAME HOOK—N. S. Wilson, Meridian, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. In the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the ehortest possible time.

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Tbe above is a name familiar to many miners on this coast who for years have had him provide them with mining and milling supplies for placer, quartz or drift mining operations, years of successful experience enabling him to supply everything in that line of a guaranteed quality and at a low rate. One of his specialties is the silver plated amalgamating plate, which is in such high favor among mill men. Each plate is made of the best soft Lake Superior copper, guaranteed to have full weight of silver, and made throughout in the best manner.

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MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

Company and Location.	No.	ASSESSMENTS. Amt.	Levied, Deling't and Sale.	Secretary.
Booth G M Co, Cal	5	2c	Feb 18, Mar 25, Apr 17	Geo R Spinney, 310 Pine
Bullion M Co, Nev	44	10c	Jan 21, Feb 26, Mar 21	R R Grayson, 331 Pine
Challenge Con, Nev	18	5c	Feb 19, Mar 28, Apr 16	C L McCoy, Mills Building
Confidence S M Co, Nev	25	30c	Jan 9, Feb 13, Mar 6	A S Groth, 414 California
Con New York, Nev	13	5c	Feb 19, Mar 26, Apr 17	Chas E Elliott, 309 Montgomery
Crescent M Co, Cal	1	10c	Jan 15, Feb 16, Mar 11	A K Durbrow, 309 Montgomery
Eureka Con, Nev	13	25c	Feb 19, Mar 25, Apr 11	H P Bush, 134 Market
Golden Eagle M Co, Nev	1	15c	Jan 8, Feb 28, Mar 4	E B Holmes, 309 Montgomery
Gould & Curry S M Co, Nev	75	15c	Jan 17, Feb 19, Mar 12	A K Durbrow, 309 Montgomery
Inyo Marble Co, Cal	26	10c	Jan 21, Mar 6, April 5	W W Sargeant, Mills Building
Julia Con M Co, Nev	26	5c	Feb 13, Mar 20, Apr 10	J Stadtfeld, Jr., 309 Montgomery
Justice M Co, Nev	58	10c	Feb 9, Mar 14, Apr 3	R E Kelly, 309 Montgomery
Reed M & M Co, Nev	1	2c	Dec 31, Feb 11, April 3	John H Isham, room 33, Mills Bldg.
Sierra Nevada S M Co, Nev	108	25c	Jan 16, Feb 20, Mar 11	E L Parker, 309 Montgomery
Standard Gravel Co, Cal	1	12c	Jan 25, Mar 4, Mar 22	W H Schmidt, 207 East

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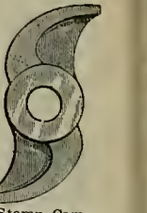
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Assessment Notices.

FAIRFAX VILLA COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 19th day of February, 1895, an assessment, No. 2, of one hundred dollars ($100) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of March, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 9th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office—Room No. 56, No 309 Montgomery street, San Francisco, California.

CHALLENGE CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the nineteenth (19th) day of February, 1895, an assessment (No. 18) of Five Cents (5c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 35, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-sixth (26th) day of March, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on TUESDAY, the sixteenth (16th) day of April, 1895, to pay the delinquent assessment, together with cost of advertising and expenses of sale.

By order of the Board of Directors.

C. McCOY, Secretary.

Office—Room 35, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

BOOTH GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Auburn, Placer county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the eighteenth day of February, 1895, an assessment (No. 5) of Two (2c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, No. 310 Pine street, Room No. 28, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on WEDNESDAY, the seventeenth day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. R. SPINNEY, Secretary.

Office—No. 310 Pine street, Room No. 28, San Francisco, California.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia district, Storey county, Nevada.

Notice is hereby given that at a meetiug of the Board of Directors, held on the 21st day of January, 1895, an assessment, (No. 44) of 10 cents per share was sold on THURSDAY, the 21st day of March, 1895, levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 21, No. 331 Pine Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of February, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office, Room 21, No. 331 Pine street, San Francisco, California.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California; location of works, Inyo, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 21st day of January, 1895, an assessment (No. 26) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 13, third floor, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 5th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. W. SARGEANT, Secretary.

Office—Room 13, third floor, Mills Building, San Francisco, California.

DUMBARTON LAND AND IMPROVEMENT COMPANY.—Location of principal place of business, San Francisco, California. Location of works, in the counties of Alameda and Santa Clara, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 22d day of January, 1895, an assessment (No. 7) of 12½ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 214 Pine street, room 55, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of February, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on THURSDAY, the 21st day of March, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JABEZ HOWES, Secretary.

Office, Room 55, 214 Pine Street, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from W. Thomas et al., in the Central Hill Mine, Douglas Flat, Calaveras Co., Cal., to impound tailings behind stone dams in ravines; from Giovanni Rossi, in the Kate Gray Mine, near Volcano, Amador Co., Cal., to impound tailings behind log and brush dams below mine; from J. E. Newsom, in the Shealor Mine, near Volcano, Amador Co., Cal., to impound tailings benind log, rock and brush dam in Sutter Creek; from Giani Demartini et al., in the Rail Road Hill Gravel Mine, near Fourth Crossing, Calaveras Co., Cal., to impound tailings behind a dam on flat ground; and from James Slater, in his mine near Brownsville, Yuba Co., Cal., to impound tailings behind York Mining Co.'s dam, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Feb. 25th, 1895, at 1:30 P. M.

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Coast Industrial Notes.

—The city savings banks hold deposits aggregating $100,000,000.

A carload of salmon is being daily sent East from Gray's Harbor, Wash.

Watsonville, Santa Cruz Co., has shipped two carloads of apples to England.

The Western Iron and Steel Co. is about starting up its Lake View, Wash., rolling mill with 125 men at work.

A second shipment of a cargo of 600,000 feet of lumber to Hawaii has been made from Port Angeles for the Honolulu Railroad.

—Up to last Tuesday 14,447 names were on the registered list of the unemployed at the Bureau, 60 Eighth street, this city.

—Columbia river fishermen will hereafter have to pay an annual license of from $2.50 to $200, according to the manner of catching fish.

An electric line between Tacoma and Seattle is projected. Between the railroad and Sound steamers the new line will hardly prove remunerative.

Senator White last Monday presented a memorial from 20,000 citizens of southern California requesting the early construction of a breakwater at San Pedro.

It is reported in Victoria that $2,000,000 have been subscribed in Montreal towards building a smelter at Naksup, and that the scheme is backed by the C. P. R.

The Canadian Pacific earnings for the week ending February 7th, were $331,000 against $384,000 for the corresponding period last year, being a decrease of $53,000.

A company has been organized in this city, with $1,000,000 capital stock, with a view to full representation of California manufactures at the coming exposition in the City of Mexico.

"The lumber market is booming. Sugar pine is now worth about $80 a thousand and is still on the rise. Other classes of lumber have gone up, too," says the Dunsmuir *News*.

W. L. Keene & Co., of Vancouver, have arranged for a line of sailing vessels to leave San Francisco every fortnight, carrying nonperishable goods to Vancouver and B. C. points.

—The Southern California Railway Co., which some years ago changed from wood to coal, has about completed arrangements for locomotive steam making by burning crude petroleum.

—It is estimated by hotel and railroad men that there are 20,000 visitors already in southern California, and that the present severity of Eastern weather will nearly if not quite double that number.

One hundred thousand negroes will leave Alabama, Georgia and Louisiana for northern Mexico in the next few months. A colony has been founded under the auspices of the Mexican Government.

—The annual Fiesta or Carnival at Los Angeles, Cal., will take place this year from the 15th to the 20th of April, comparing in splendor and interest with the Carnival of Rome or the New Orleans Mardi Gras.

—The Seattle & Lake Washington Waterway Company will mass its excavating plant. The dredger now in use at Olympia and the one at Portland will be brought into requisition. The latter machine was built at a cost of $124,000.

The San Francisco owners of the big Port Discovery, Wash., mill, whose machinery has been idle for several years, have arranged for the outlay of $100,000 in improvements and working capital, and the mill will soon be operated at its full capacity of 300,000 feet daily.

—Surveyor-General W. S. Green calls for bids for the resurvey of three southern California forest reserves—173 miles to establish the lines of the San Bernardino forest reserve, 154 miles for the San Gabriel and forty miles for the Trabuco Canyon reserve—according to executive proclamation.

—San Francisco is soon to inaugurate an industry that has hitherto been confined in this country to New York City—that of whalebone cutting. While much of the world's supply of whalebone is landed here from the whaling ships, it has hitherto all been sent to New York and London to be cut for use.

—The White River Water Power Co. has been incorporated in New Jersey, with a $2,000,000 capital stock, to build an immense electric power plant in northwestern Washington. It is intended to tap the White river near Buckley, and carry the water in an open ditch to Lake Tapps, near Sumner, where a storage reservoir will be built. From there the water will have a 450-foot fall to the power house, where it is intended to have a generator capable of developing 25,000-horse power.

The Treasury Department decides that on the exportation of steel rails measuring twenty feet in length and weighing twelve pounds to the running yard, manufactured by the Pacific Rolling Mills wholly from imported steel blooms, a drawback will be allowed equal in amount to the duty paid on the imported material used in the manufacture, less the legal deduction of one per cent. The quantity of the material so used may be determined by adding to the net weight of the exported rails ten per cent of such weight.

—Last Tuesday the California Wine Makers' Corporation sold to the California Wine Association 18,000,000 gallons of wine at twelve and one-half cents per gallon—the largest transaction of the kind in the history of the country. The wine dealers also bought six large wineries, situated at St. Helena, Napa, Livermore, San Jose, Glen Ellen and Esparto. By the terms of the contract 4,000,000 gallons are to be delivered and paid for this year, at the price named, and 5,000,000 gallons in each of the succeeding three years, at the then ruling rate.

—Evidence of the extent to which our wheat trade with Germany has suffered by the competition of the Argentine Republic is contained in a report to the State Department by Frank H. Mason, United States consul-general at Frankfort, upon the German wheat imports for the past three years. In 1892 the United States shipped to Germany 6,302,130 tons of wheat. The next year this dropped to 3,149,282 tons, and in 1894 the imports were but 3,054,669 tons. Meanwhile Argentine seemed to have gained about what we lost of the trade, for the imports of wheat from that country into Germany, amounting in 1892 to but 661,697 tons, had swelled in 1893 to 1,513,961 tons and in 1894 to 3,196,190 tons.

—W. F. de Land, who is connected with the Lower California Pearl Fishing Company, reports that the past season has been quite successful. The company has a number of schooners and forty launches, each of the latter being equipped with machinery and diving apparatus. About 600 men are employed by the company, and they fish for 1000 miles along the border line of Guatemala, around the coast of Oaxaca and Guerrero, and up to the mouth of the Colorado river in the Gulf of California. Quite a number of pearls were found this year, some of them being very large. One weighed 17 carats, another 15, another 12 and still another 10. The pearls are white, black, and different shades of green and blue—the green and blue pearls being found in no other fisheries in the world, and they are very valuable.

—John S. Morgan of Selby, gave an exhibition on the bay this week, of his new device of driving a vessel over the surface of the water without paddles, sails, wheels or propeller. His launch, the Eleanor, has a gasoline 6 H. P. engine, and steams seven knots an hour. Water is injected through valves in the bottom of the boat amidships, and forced out through an inch and a quarter pipe in the stern. The delivery tube is below the surface, and the resistance which the rejected stream meets when it encounters the dead water outside pushes the boat ahead. Mr. Morgan claims that his method of ejecting the water by a single-action pump, in a succession of separate strokes, is an improvement over the continuous stream experimented upon by the marine engineers who have been attempting this new means of propulsion. The boat can be stopped or backed by reversing the current passing through the hull and driving it out through the bottom valves, the direction of their insertion being such that the ejected water is driven toward the boat's head.

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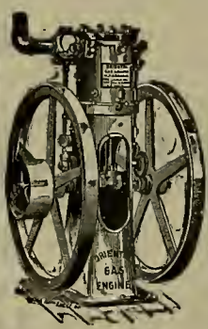

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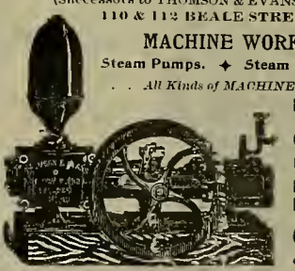

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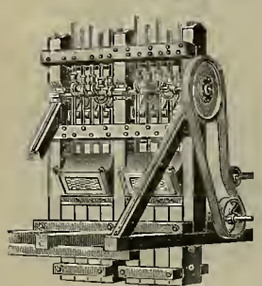

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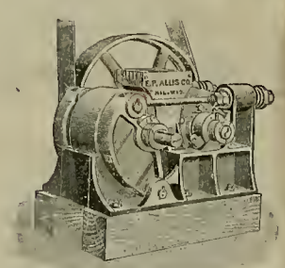
Compressors,
Boilers,
Etc., Etc.



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MINING AND SCIENTIFIC PRESS.
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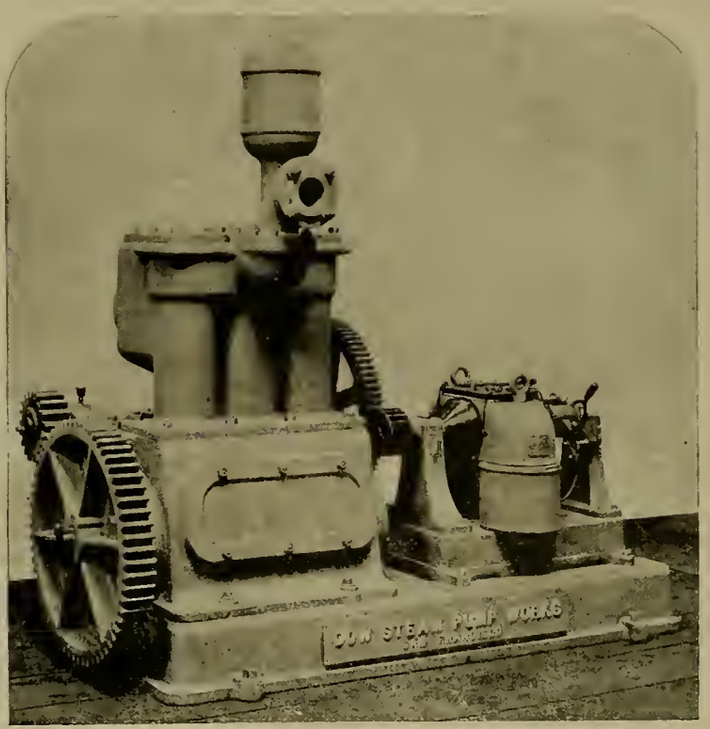
VOLUME LXX. Number 9.

SAN FRANCISCO, SATURDAY, MARCH 2, 1895.

THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Largest Freight Wagons in the World.

The wagon shown herewith was designed and made by the Best Manufacturing Company, San Leandro, Cal., and was built especially for steam freighting in connection with the company's traction engine. The capacity of these wagons is sixteen tons each, and they have sufficient wheel surface to sustain that amount without injury to the roads—in fact, they pack the road. The dimensions and description in detail are as follows: Size of axles, four inches in diameter; front wheels, four feet ten inches high—tire, sixteen inches in width; rear wheels, six feet high—width of tire the same as front wheels; length of bed, nineteen feet six inches; width of bed, four feet six inches; height of bed, six feet. They are made wholly of iron and steel, except the bed which is of wood. The front wheels track somewhat wider than the rear ones, for this reason: The continual hauling over the road and the wagons always running in the same tracks naturally cuts down the road into ruts to a certain extent and makes it uneven. This the makers wished to overcome, and as the engine wheels are twenty-six inches wide they designed the front wheels of the wagons so that the tire tracks would lop one-half the width of the engine wheels on the inside. The rear wheels of the wagons travel so as to lop one-half the width of the inside of the track of the front wheels, thus packing the road smooth and firm and always clear of ruts where the wheels travel.



DOW'S IMPROVED TRIPLEX POWER PUMP.

Triplex Power Pump.

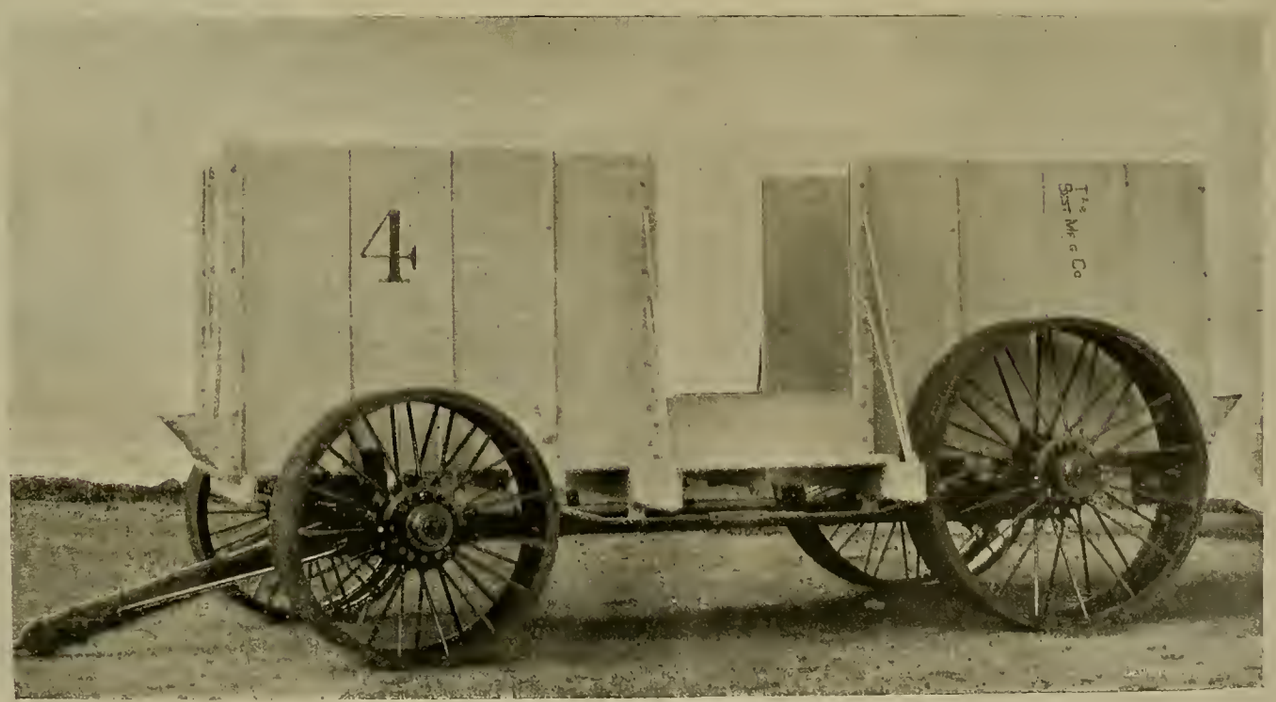
The Dow Steam Pump Works, 114 116 Beale St., have issued a handsome catalogue of their improved power pumping and hydraulic machinery which present data of value to those interested in steam and hydraulic engineering. Herewith is illustrated one of their improved triplex power pumps of vertical mining pattern, for mine station pumping with electric motor, as successfully applied to mine station pumping, and for situations where water power is available for generating electricity.

The crank shaft and connecting rods are operated in a closed chamber in which oil is retained and the connections made self-lubricating. A high rate of speed can be obtained without pounding or detrimental wear, thus obviating constant and careful adjustment.

They have patterns for this class of pump up to a capacity of 300 gallons per minute, and height of 300 feet.

They can furnish pumps with or without electric motors.

The Dow pumps have been endorsed by the United States Government by ordering them in the construction of battleships and cruisers, and are of acknowledged value.



FREIGHT WAGON BUILT BY THE BEST MANUFACTURING COMPANY.

It is almost a forgotten fact that from 1793 to 1873 American silver dollars were at a three per cent premium in Europe, and went eastward almost as soon as coined. Times change.

Nearly eight per cent of the union workmen in Glasgow, and eighteen per cent of the union shipbuilders there, are out of employment, owing to dull times.

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Our latest forms go to press on Thursday evening.

J. F. HALLORAN.....General Manager

San Francisco, March 2, 1895.

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WITH the advent of the new railroad comes promise of increased business for the wood-workers and iron-workers of the State. It goes without saying that everything in iron or steel from a spike to a locomotive can be made and should be furnished here.

THE coming Mexican International Exposition affords opportunity to San Francisco manufacturers of mining machinery to enlarge their market. There is a splendid field in Mexico for mining machinery of approved make, a fact which our local manufacturers should not be backward in realizing.

THE State Manufacturers' Convention, on the 19th inst., at the Chamber of Commerce in this city, is an important and necessary move. The main proposition is union and organization, the fostering of new industries, and, in general, the industrial emancipation of the State. Under rightly related conditions there is no valid reason against such consummation, which must manifestly result in mutual prosperity.

UNDER "the Timber Land act," any one may take up 160 acres government land, valuable chiefly for stone, complying with all provisions just as in the taking up of land for the timber on it—the payment of $2.50 per acre, publication of the required notice, filing of the affidavit of publication, appearance with two disinterested witnesses before the local land office register, etc. In such cases the non-mineral character of the land must be sworn to.

THAT gigantic gold mine referred to in these columns some time ago, enabled its directors and stockholders to declare a $7,000,000 dividend last month. It is too good a thing to let get this far west, the opportunity to invest being limited by Messrs. Cleveland and Carlisle solely to Wall Street and English buyers. The whole business discredits the nation, but that is of minor importance. California stock deals sound slim and meager alongside such transactions, whereby a profit of seven millions is made certain in a gold mine without even one assessment.

A LOS ANGELES SUBSCRIBER questions the statement last week in "Concentrates" that gold during the week had commanded a premium of ⅜ of 1%. Here are the facts in detail: On Friday, in New York City, there was a draft on the depleted gold reserve of $665,000. Of that sum Russell Sage withdrew $550,000. He had no use for it for export purchases, but put it in a storage vault. He had gold bullion additional amounting to $450,000. A subscriber to the bond syndicate wanted the gold, and, seeing a good profit, paid ⅜ of 1%, or $3750 premium to Sage for the million to buy bonds with. The fact is of common report in the New York papers. The PRESS draws no political, that is partisan, conclusion. The matter was boiled down to a one-line statement, but was and is actually true.

New Gold Processes.

Nearly ninety years ago it was observed that gold was soluble in cyanide of potassium, but for more than half a century the fact was a chemical curiosity, a laboratory demonstration, with no practical application. In later years the matter has received world-wide attention among metallurgists, and for the last five years "the cyanide process" has in some instances revolutionized gold-saving methods.

In the last few weeks from London and Arizona come accounts of gold extraction processes based on the cyanide system, with, it is claimed, such improvements as will result in its more extended efficiency. The importance of the interests involved and the widespread interest in the subject justify notice.

Assuming that our readers are in general conversant with the principles of the MacArthur-Forrest system, which may be considered the standard, it may be said of the process now being tested in two Arizona mines that it is an elaboration of that treatment. There the ore is crushed to a certain fineness, depending on the character of the gangue, then placed in leaching vats, having the usual false bottoms for filtration, and a solution of cyanide of potassium and other chemicals of determined solution is run over the pulp and is left to stand for some hours. It is then drained off, and another charge is used of less strength, which is in turn also drained off. The pulp is then washed with clean water, which leaches all the gold and silver, and leaves the tailings ready for discharge either in cars or to be sluiced away. The filtered solutions and washings from the leaching vats are passed through a precipitating box, which is practically an electric cell, the positive plate of lead and the cathode or negative pole being mercury. A dynamo supplies the current, which is of sufficient pressure to decompose electrolytic liquid, a circulation being thus kept up. The solution formed of the double cyanide of gold and silver, as it goes along yields up these metals under the action of the current, and is gathered on strips of copper connected with the mercury. The solution can be used over and over again by re-enforcing it to the desired percentage, and it is asserted by the experimenters that by this electro-chemical cyanide process a capacity for handling 10,000 tons of pulp per month will run at a cost of about $2 per ton. Bullion recovered by this method is claimed to be in fineness in excess of that which is zinc precipitated.

The London process is being praised at unusual length in sundry London journals. The originator of this latest announcement in the gold-mining world is H. Livingstone Sulman, an analytical chemist, who, though he never saw a gold mine, is confident he has a discovery that is of the greatest practical merit. This confidence seems largely shared by his confreres.

He denies the necessity of oxygenation, hitherto considered so essential a part of the cyanide system. He asserts that he can dispense with oxygen altogether, and make the cyanogen all potential. Discarding that factor in the MacArthur-Forrest equation he uses a haloid salt, a bromide of cyanogen, and adding a small quantity of this to the ordinary cyanide solution, claims to thus secure unprecedented rapidity in the desired result. Concentrates ordinarily requiring two weeks can, it is asserted, be successfully treated by the Sulman process in less than forty-eight hours, no matter what the quality of the ore, and the slimes, hitherto found so recalcitrant, can, he asserts, be leached with success. His process for slimes is to add a soap solution, stir vigorously and clot with lime, thus making the mud granular and susceptible of leaching. When it is borne in mind that while 600,000 ounces of gold were produced from battery tailings in the Witwatersrand district, South Africa, in '94, an estimated value of $1,500,000 was lost in the slimes during the same time by inability to treat them, it will be seen what success in that direction means. Mr. Vautin, a colleague of Sulman's, asserts that the extraction of gold from slimes in this manner is successfully demonstrated. This matter of securing the gold from slimes has been given practical attention at the mines. Attempts have been made to prevent or obviate their formation; or by substitution of air for water at the stamps. It has been tried to work slimes holding over one-half an ounce to the ton, and persistent disintegration has with such rich slimes extracted the gold at a cost about equaling in value the output, being poor inducement for experiment with slimes carrying but one-half or one-third such quantity of gold. The Sulman-Vautin process would with slimes alone, if successful, make every such mine worth far more than at present.

Beside discarding the oxygen of the present process, the London chemists claim to have also done away with the necessity of the zinc shavings, substituting an emulsion of zinc fumes, saving, according to their view, the expense of smelting.

A minor point, not wholly devoid of interest, is the assertion of Mr. Sulman that the reason that "float gold" floats on water is the "surface tension". Were this "surface tension" counteracted or neutralized, he claims that annoying feature would disappear. This also he claims to be able to overcome. He says "a morsel of common soap" will destroy this surface tension.

The greatest interest is manifested in British mining circles over this new announcement. One company has already bought patent rights for South Africa; another for Australia, and a third corporation has secured similar rights in Mexico. If the discoverers and the believers in them be not egregiously deceived, the problem of cheap extraction of gold in the class of ores most susceptible of treatment by that general process is nearer solution than ever before.

The idea is not wholly original. Less than six months ago an assayer in northeastern Washington wrote to the MINING AND SCIENTIFIC PRESS that he had discovered that bromine could be substituted in the cyanide process, with a request that nothing be said about it till he had practically demonstrated and secured his claim. In other quarters the same chemical possibility has also been noted. Englehardt has a bromine process claimed to be successful. Nor is bromine the only substitute for oxygen in this oxidizing process. Sodium peroxide has given similar satisfactory result in laboratory experiments. But it were invidious to withhold a single laurel from the wreath that will crown the successful discoverer in practical fields of science, whoever or wherever he may be. The London announcement, briefly synopsized above, is making tremendous stir, and upon the proven results of rigid tests and practical experience will depend its outcome.

HOW THE THREATENED legislative attack on the California State Mining Bureau is viewed elsewhere is well exemplified by the following, which is but one of such letters recently received:

—OFFICE OF—
THE MIXSELL MILL.
PHILIP MIXSELL, MGR.

One of the Most Complete Concentrating and Stamp Mills in the State. — *Also Manager of Several Producing Mines.*

IDAHO SPRINGS, COLO., Feb. 23, 1895.

Mr. J. F. Halloran:—Enclosed find $3.00 for another year of your most excellent journal. If your State Legislature repeals the State Mining Bureau bill it will be taking a step backwards. The reports from that Bureau are of the utmost value, and I know it has been through those reports that California has secured so many Colorado mining men of means. Yours very truly, PHILIP MIXSELL.

THE articles in the PRESS last July on the mines and mineral possibilities of Mariposa, are bearing abundant fruit in the renewed attention given that mining region. No part of California promises more immediate activity than the Coulterville district, and the preparations are on a scale commensurate with the interests involved. A 300 stamp mill, a railway from it to the different mines owned by the new company, electrical generators, etc., evince the change from the sleepy old inertness to the new era when from 600 to 800 men will be busy adding millions from Mariposa to the world's golden wealth.

SEVERAL inquiries have recently been received as to whether gypsum is or is not considered a mineral under the mining law. In answer it may be said that gypsum can be located in the same general manner as a placer claim—twenty acres—the Commissioner of the General Land Office so interpreting the matter. The most recent location of a gypsum claim that has came under our observation is that of Chas. King, of San Benito.

Concentrates.

THE Keystone mill, at Amador City, is again in operation.

THE Standard Con. Mining Co. pays a 10-cent dividend on the 20th inst.

A NEW STAMP MILL is about completed on the Oro Fino (Montana) gold mine.

ANOTHER effort is making to develop the Eutopia, Lake Co., quicksilver mine.

THE new forty-stamp mill at the New London, Plymouth, Amador Co., is about finished.

THE Hayden Hill Mining Co., Hayden Hill, Lassen Co., are about to put in a ten-stamp mill.

LABOR TROUBLES have closed up the Morning Glory mine and mill on Turkey Creek, Arizona.

THE Alaska-Mexican Gold Mining Company will shortly add sixty stamps to its mill on Douglas Island.

IT is reported in Prescott that G. W. Hull, of Cerome, has bonded his mining properties in that camp for $160,000.

DR. SCHLOESSER, of Chicago, has bought a controlling interest in the Evening Star mill and mine near Susanville.

BETWEEN $3000 and $4000 in gold has been taken by sluicing from Gold and Demon creeks, Alaska, since December 1st.

J. A. MAXFIELD, a well-known Comstock miner, was recently killed by an exploding blast in a mine at San Miguel, Mexico.

THE Delano Mining and Milling Company has filed articles of incorporation; capital stock, $500,000; principal office, Boulder, Col.

THE January output of the Butte & Boston (Montana) mine was 1,456,800 pounds of copper, 103,400 ounces of silver and 205 ounces of gold.

A SALT LAKE company is getting ready to work the tailings at the Voorhei's & Barney sulphuret works, in Drytown, by cyanide process.

THE Arizona Copper Company has been incorporated in Philadelphia; capital, $50,000; to operate in Boulder county, Col., and Arizona.

IN the Alaska mine, at Pike City, Sierra Co., last week, a large ledge of fine ore was uncovered. The quartz shows plenty of free gold.

THE *New Era* reports that a San Francisco mining expert has leased the Jenkins mill at Kennedy, Nev., and intends to put it in operation.

THE new owners of the Silver Bow Basin mines, Alaska, have decided on the building of a mining plant to rival the Treadwell in size.

IT is again asserted that the Mammoth and Collins mines, Arizona, are to be sold to an English company who will operate them on a big scale.

B. MCCORMICK, employed at the Providence mine, Nevada City, was killed last Sunday by being caught in the spur wheel of the hoisting rig.

THE Octopus Gold Mining and Milling Co. has finished a twenty-stamp mill in Bruno district, Elko Co., Nevada. It will be run by water power.

MESSRS. GREEN & RYAN, Saginaw, Mich., lumbermen, have bought three claims, the Eureka group, in the Slocan district, for the reported price of $50,000.

THE coal output in the different mines of Wyoming for the past year was 2,202,000 tons. The number of fatal accidents was thirteen, out of 3453 men employed.

"IN general," says the Denver *Mining Industry*, "it may be presumed that no part of the United States has better facilities for cheap mining than California."

TO DATE the Hope mine of Montana has paid $593,250 in dividends. The latest was a $10,000 dividend January 23d. Nearly 100 men are now employed in the mine.

THE Home mine on Deer creek, Nevada county, which lay idle for nearly fifteen years, is now being worked with very flattering prospect for a resumption of dividends.

THE De Lamar Mining Company of Idaho is now putting in a complete arc light plant in addition to the incandescent plant, to light their mills and the streets of the city.

THE War Eagle, Trail creek, B. C., was jumped last week because the foreign company, now the owners, had not registered in British Columbia. Costly litigation may follow.

AT Slate creek, Wash., the Excelsior group, owned by Carish, Temply and Beuson, of Anacortes, have been bonded to a New York syndicate for $40,000 and cash payment of $2500.

THERE is a bill before the Nevada Legislature which provides for the removal of the State capital to any city or town in the State which will contribute $100,000 into the State treasury.

THE Excelsior Company have suspended hydraulic operations at Smartsville. They will probably dig a considerable piece of ditch, and move several hundred feet of water pipe before resuming.

THE cyanide tanks at Wickenburg, Arizona, are reducing Vulture tailings, two bars of gold of the value of 65 and 72 ounces each being recently received in Prescott. The tailings average $5 per ton.

AT Juneau, Alaska, N. H. Gaddis has been acquitted of stealing $1000 worth of amalgam from Thorp & Bounifield's mill last August, and $3500 from the Ebner mill in October and November last.

THE Gem (Idaho) mine laid off about forty-five men recently. But little more work than sinking the shaft and other development work below the tunnel level will be prosecuted for the next four months.

A STRIKE is reported in the O. & C. mine, at Henley, Siskiyou Co. Twenty-seven tons of ore are being treated at the Selby Works. Some of the ore runs $300 to the ton. A five-stamp mill is being built.

THE Kootenay Water Supply Company are putting in a dam at Waneta to supply water power to pump a thousand inches into the main ditch of the Kootenay Hydraulic Company for use in washing their gravel banks.

THE Mountain View Mining Co., which recently bought the Star and Roebuck mines, near Fine Gold, Madera, propose employing about fifty men when their new twenty-stamp mill, now being contracted for, is in operation.

THE passage of the bill for establishing a coinage mint in Denver, to take the place of its present purchasing mint, and coin the gold where it is produced, recognizes Colorado's importance as a producer of the monetary metals.

J. H. NEFF, of Placer Co., learning that the funds of the Miners' Association would not warrant the publication of the proceedings of the last convention, became personally responsible for the payment of the bill, and the work is going on.

THE following are recent incorporations: The Pinon Mining and Milling Co., San Francisco, capital stock, $20,000,000; the Jones Creek Mill and Mining Co., Crescent City, $80,000; Northwestern Mining Bureau, Seattle, $50,000.

THE Morning Star Company, Iowa Hill, has declared another dividend of $3 per share on the capital stock. This makes the second dividend in a month by that mining company, the first one being $4 per share. Most of the stock is owned in Grass Valley.

LAST Tuesday Senator Perkins presented in the U. S. Senate the joint resolution of the Legislature of California for free coinage of silver; also the resolution urging the immediate appropriation of $20,000 for the support of the California Debris Commission.

THE Alaska-Treadwell Company makes the following report for the month of December, 1894: Ore milled, 19,807 tons; sulphurets treated, 345 tons; bullion from sulphurets, $14,625; bullion shipped, $44,347; bullion yield per ton of ore crushed, $2.24.

THE Denver smelters and large producers of gold have been sending their gold East in bars the past month on account of receiving one-half per cent higher price than the Government pays for coinage purposes there and at Philadelphia, making gold a commercial commodity.

GOVERNOR BUDD has transmitted to the California Senators and Representatives in Congress, in accordance with the request of the Legislature, Assembly Joint Resolution No. 20, relative to securing immediate attention from Congress to the United States Debris Commission.

THE proprietor of the Golden Shaft mine, at Dutch Flat, has been notified by the California Debris Commission to cease hydraulic mining. In answer it is asserted that the Golden Shaft is a drift mine pure and simple, the gravel being taken out of a ninety-foot shaft.

AT a meeting of the officers of the County Miners' Association in Auburn last Saturday, it was decided to take such steps as would be necessary to obtain funds for the support of the State Association. Two hundred dollars was ordered sent to the treasurer of the State Association.

J. M. BUFFINGTON has made arrangements at the State Board of Trade rooms, in this city, for the display of minerals from Nevada county. It is the desire to have each mine in the county represented. From ten to fifteen pounds of ore is as much as is desired from any one mine.

IT is reported that a syndicate of San Francisco capitalists are negotiating for the purchase of the Sterling mines, in Josephine Co., Oregon. This report has been circulated so often that not much dependence is placed upon it. The mine is a rich placer and is equipped for good work.

THE English company which recently bought the Iron Mountain mine, in Shasta, are surveying for a twelve-mile railroad from the mine to the S. P. track. They have not yet decided whether to work the ore there or ship to Selby, though the railroad proposition would imply the latter.

UTAH'S production of silver for the year 1894 was 6,534,182 fine ounces, of a coinage value of $8,458,200, and an actual market value of $4,114,573.40, figured with silver at an average quotation of 62.97 cents. Of gold the territory produced 54,570 fine ounces, with an actual value of $1,128,100.

THE concession granted last June for the construction of a railway in Lower California from the port of La Paz to the mining camp of El Triunfo, with a right to extend the line to Ensenada or Pescadero del Pacifico, has been declared null and void, owing to the failure of the concessionaire to deposit the required guarantee.

THE Green Mountain Gold Mining Co. has secured control of the Green Mountain cement gravel mines in Chili Gulch district, Calaveras Co., comprising about 150 acres through which run gold-bearing channels, which are to be worked to the fullest possible extent. Considerable machinery and material went with the purchase.

THE Alaska-Mexican Company reports its cleanup as follows for the month of November, 1894: Period since last return, 30 days; ore milled, 6058 tons; sulphurets treated, 137 tons; bullion from sulphurets, $4431; bullion shipped, $13,864; working expenses, $11,819; balance, $2045; average total return per ton, $2.29; expenses per ton of ore milled, $1.65.

THE Eureka Tellurium Gold Mining Company have elected the following directors: W. P. Sweezey, president; Geo. C. Jones, vice-president; J. S. Ludlum, secretary and treasurer; Anna M. Ludlum, Peter Scherer. The Redding *Democrat* says the company has an entire new process by which they will work the ore of the mine. It is a dry process.

IN the Sacramento office is being argued a suit which involves the possession of land claimed in the Mammoth and St. George quartz claims in Amador county. The question is whether it is most valuable for mineral or agricultural purposes. In any other State than California the production of gold would definitely determine the question, but 'tis different here.

GEO. W. EDWARDS, of Indiana, has bought the Spanish Hill placer mine, one mile from Placerville, El Dorado Co., and has commenced preparations for work on an extensive scale. This mine in days past was a large producer of gold, and C. W. Brewster is said to have purchased from the original locators of the claim—three in number—gold dust amounting to over $1,500,000.

A RICH vein of quartz has been struck in the La Marque mine, Nevada Co., at a depth of eighty-five feet, and the quartz taken from it is of high grade. The mine is situated in the neighborhood of the North Star and is being worked by Maltman & Thompson, who obtained a bond on the property several months ago. It is an old mine and has been worked in a small way for many years past.

THE mining share excitement in London and Paris, with shares of properties in the Witwatersrand district of South Africa as its object, says *Bradstreet's*, has had a limited but very necessary set-back. Prices for some of the low-priced shares which depended to a considerable extent upon constant puffing and advertising have had a material drop, and new issues, particularly of West Australian properties, find less favor with the public. In the opinion of the most candid observers of the situation, the movement has been overdone, and, as most of the public buying has been of an outright kind, the lockup of funds for this purpose has exhausted the available supply and caused the London mining market to assume a tired appearance.

THE property of the Oregon Gold Mining Company, at Cornucopia, Union county, Oregon, was last week sold by the sheriff, under foreclosure. The property sold includes several mines, among which is the Red Jacket, a good gold property, and a quartz mill which was built several years ago at a cost of $150,000. There were only three bidders. It was bid in by P. Basche, of Baker City, for the sum of $9000. It is understood that the bid was made on behalf of the Oregon Mining Company itself.

THE Gold Ore Treatment Co. has been organized in London, to take up commercially the matter of the new gold solvent, recently reported to have been produced experimentally by H. L. Sulman. It is a modification of the cyanide process: To a solution of potassium cyanide is added bromide of cyanogen; it is claimed with very satisfactory results. An economical process of producing the bromide of cyanogen, by which its cost need not exceed seventy cents per pound, is also reported to have been found by Mr. Sulman.

SENATOR WHITE has introduced a bill providing that in all entries of placer mines made under the provisions of the Revised Statutes by associations, or persons, or their assigns, proof of discovery of minerals on each twenty acres of land embraced by the entries shall not be required, but proofs of discovery of minerals and development thereof on any part of the entire land shall be deemed sufficient. It is provided, however, that the full amount of $500 must be expended for the development of each claim, as now required by law.

"THE Golden Star Gold Mining Company of Montana has a capital of $300,000 divided into 300,000 shares of a par value of $1 each. The company has ore in sight worth $100 to the ton, but in order to improve the property the directors have decided to put on the market a limited amount of stock which will be sold at 40 cents per share. As soon as the shaft is completed, the sale of shares at this price is to be discontinued," etc. So says the prospectus. The whole thing is a fraud, and, like other fake schemes, tends to injure legitimate mining interests.

THE case which the Commissioner of the General Land Office has decided in favor of Jno. McBride, by which he is awarded 120 acres of Section 16 of Tacoma, as a placer mineral claimant, has cost the State of Washington about $45,000, and Mr. McBride has expended about $17,000. The testimony taken occupies 8000 close type-written pages. The value of the land is estimated at from $3,000,000 to $5,000,000. The Secretary of the Interior has made the case special and it takes precedence over any actions, so that a final decision may be looked for within ninety days.

REPRESENTATIVE CAMINETTI'S resolution to suspend the patenting of land within grants to Government-aided railroads until January 1, 1896, having been unanimously reported from the Public Lands Committee, is a privileged question and can be called up at any time. Caminetti is watching his opportunity and will try to get this measure through before the close of the session. Senator White will take care of it in the Senate where the principal opponent of the resolution is, of course, Senator Stewart, of Nevada. He has already announced that he is opposed to taking this action.

LONDON men are investigating the California Water and Mining Co.'s ditch property in El Dorado county, with the idea of purchasing and developing it into a paying proposition. The Eastern owners are "conservative," and don't care to spend the necessary money to develop it. Chas. Blagburn, an English engineer who has been examining the property, believes that the expenditure of between $300,000 and $400,000 would result in business netting $75,000 or $80,000 annually. The property is a valuable one, including water rights, ditches from Loon lake, etc., and properly developed would be of value to quartz miners and fruit lands on the Georgetown divide.

RECENT local mining incorporations are the San Francisco and Cripple Creek Gold Mining Company. Principal place of business, San Francisco. Capital stock, $1,500,000, with T. N. Handy, W. K. Flint, H. A. Moss, D. E. Besecker and E. L. Ligget as directors. The Potosi Mining Company of Shasta. Principal place of business, San Francisco. Capital stock, $300,000, with F. Wieland, F. L. Ruhm, R. Klump, H. Jung and F. H. Jung as directors. The Mountain Chief Mining Company—Principal place of business, Willows, Glenn county. Capital stock, $30,000, with C. W. Grayson, Jr., C. L. Donahoe, J. F. Sersanous, W. H. Sale and J. H. Graves, all of Willows, as directors.

THE miner's bill has passed both Houses of the Legislature, and now only needs Gov. Budd's signature to be a law. It amends Sec. 1222 as follows: "The judgment and orders of the court or judge made in cases of contempt, where the contempt is committed in the immediate view and presence of the court or the judge at chambers, are final and conclusive. In all other cases of contempt the judgment and orders given or made in relation thereto are subject to review by motion for a new trial and by appeal, in the same manner in which other judgments and orders are so reviewed." That means that the hydraulic miner in this State has the same protection against arbitrary arrest that any other citizen has.

THE January cleanup of the Alaska-Treadwell shows: Shipment of bullion, $55,695; tons of ore milled, 20,491; tons of sulphurets treated, 377; of bullion there came from sulphurets, $20,405. For the six months ending Nov. 30, 1894, the working expenses were $1.38 per ton, or nearly the same as during the two previous years. This cost includes many unusual charges in connection with new machinery and with a theft of amalgam, recovery of the same and arrest of the delinquents. It is expected that, owing to new crushers, the cost of working will be further reduced. During the period under review, 122,282 tons were crushed and $307,021 realized, an average yield of $2.51 per ton as against $3.20 for the previous year. The sinking of a new shaft and the construction of new hoisting works prevented hoisting any large quantity of the higher grade ore from the 110-foot level. It is expected that from now on more ore from that level will be crushed, and that the receipts will again become equal to those of the last fiscal year. The profits for the half-year were $138,383.

Pocket Mining in California.

Written for the MINING AND SCIENTIFIC PRESS by W. H. STORMS, M. E.

The business of hunting gold pockets is a distinct branch of the mining industry in California. That, in order to be successful as a pocket hunter, one must possess a most sanguine temperament, rare perseverance and energy, and abundant self-reliance, no one who knows anything of the methods, the successes and disappointments of a pocket hunter's life will deny.

Mariposa and Tuolumne counties are the sections where pocket mining is followed more extensively than in other sections of the State, though pocket mines are not unknown elsewhere. In Calaveras county, in early days, pockets of fabulous richness were mined on Carson hill, where is situated the famous Morgan mine. This was one of the first pocket mines discovered in the State. It was located in 1850, and it is stated that from February, 1850, to December, 1851, less than two years, $2,800,000 were taken from this wonderful mine. People came from miles around to visit it, situated on the highest point of Carson hill. Robinson's ferry took in over $10,000 in six weeks as a result of the stampede. On the south slope of Carson hill a town sprang up, like a mushroom, having from 3000 to 5000 population, no trace of which remains to-day.

The Morgan mine excelled in richness anything ever found before or since. At times, so it is said, the gold occurred so abundantly in the rock that blasting was impracticable and cold chisels had to be employed to cut out the masses of yellow glisteuing metal.

The fame of the Morgan mill still clings to it, but in this age of new things it has become ancient history, and Calaveras county is no longer looked upon as a pocket mining section, though doubtless many undiscovered thousands still remain.

There are a large number of pocket mines located in Mariposa and Tuolumne counties, and some uninformed persons seem to entertain the opinion that pocket mining is exclusively engaged in in those counties. This is a mistake, however, for both of these counties have produced many millions of dollars from vein mines as distinctly different from pocket mines as those of Amador county, and there are many mines in operation there to-day employing a large number of men and producing in the aggregate much more than the pocket mines.

The Famous Bonanza Mine. — The most famous pocket mine of late years in this State is the Bonanza, at Sonora, in Tuolumne county. It is situated in the northern suburbs of the town on a smooth sloping hill.

This mine, with a record exceeding $2,000,000, is a very peculiar one, and while really not unlike other pocket mines in some important features, is nevertheless a most remarkable mine for many reasons. The pockets have ranged in value from about $4000 to over $300,000. One pocket, the largest, yielded gold weighing over 1000 pounds avoirdupois, a glitteriug mass of bright virgin gold with a considerable quantity of telluride of gold (petzite).

The total cuttings in the mine, including shafts, tunnels, wiuzes, levels, stopes, etc., are about 5000 feet. The deepest point reached in the mine is something more than 1300 feet below the croppings on the incline (about 20°).

The surface plant consists of a hoisting and pumping plant, an air compressor used to run drills, pumps and hoists underground, and a mill of two stamps. Prior to the erection of the mill about a million and a half had been obtained by using hand mortars. It has not infrequently occurred since the introduction of the mill that, when making a run, it has been necessary to hang up the stamps every hour or so to remove the gold from the battery, which had become too much loaded with the precious metal to permit further successful operation.

The value is chiefly in the metallic gold, most of which is visible to the unaided eye. Tellurides of gold and silver (petzite and sylvanite) also commonly occur. A small amount of iron sulphuret is frequently present.

It is a notable fact that the rock at a few feet, or even a few inches, from a pocket of gold, no matter how large, is entirely destitute of precious metal, merely a trace being obtainable by fire assay. The pockets ordinarily ranged from $20,000 to $50,000. I was told a few months ago that $4000 were obtained by sorting over the old dumps on Bonanza hill, where the early excavations were made. The gutter-like depression now marked by the main street of the pretty little town of Sonora, headed on Bonanza hill, and a golden harvest resulted from washing the gravel of this depression. It was this, in fact, that led to the discovery of the Bonanza mine. The method of "surfacing" for pockets will be described later.

GEOLOGY OF THE BONANZA MINE.

The Bouanza "vein," as it may be termed, though really a misnomer, is a dike of eruptive rock of light ashy-gray color, through which is disseminated greenish scales of chloritic mineral. Having never made a chemical or microscopic examination of the rock, I can only describe its physical appearance. It may be a fact worthy of note that greenish scales are found in the dikes of many rich mines of California, and in some other pocket mines. Near the surface the rock is much altered, stained with iron oxide, and banded in peculiar waving lines. It might easily be mistaken for a rotten sandstone, having a granular texture quite similar to sandstones. Specimens of this dike, both altered and fresh, may be seen in the museum of the State Mining Bureau.

The Bonanza dike is from eight to sixteen feet in thickness, striking north, 30° east, and dipping 20° to 25° north, 60° west. It cuts all the metamorphic rocks (slates, schists, limestones, etc.), and the older crystalline eruptives (diorite).

The strike of the general country rock at this place is north 30 west, with a uniform dip to the north eastward at 65° to 70°. It will be noticed that the dip of the dike is not parallel to the strike of the slates, but in a direction 30° more to the westward.

The country rock which forms the foot and hanging walls of the dike in the immediate vicinity of the pay chute are as follows, passing from west to east: a firm argillaceous rock, known among miners as "block slates:" and having a decided tendency to break up in triangular masses with smooth faces. This is succeeded by a strip of black slate four to twelve feet wide and containing an abundance of pyrite (iron sulphurets). This rock has a well-marked slaty cleavage. It is separated from the block slate by a narrow fissure, which has been persistently followed for hundreds of feet in the mine workings, the guide, as it were, to the treasure spots of this wonderful mine. This fissure is sometimes an open crevise an inch or two wide, again it contains a narrow seam of quartz, and here and there a peculiar, much decomposed material is seen which I believe to be the remains of a thin sheet of intrusive rock. A soft black mineral substance commonly occurs in the fissure. I made no test of it, though it is probably iron and mangauese. This fissure, in the language of the pocket miner, is called a "crossing," and is the strongest and best defined of a series of four fissures which occur here, having a general parallelism, and separated from each other by two to five feet of the pyritous slate. These fissures or "crossings" are usually within the limits of the pyritous slate belt.

Lying to the eastward of the pyritous slate is found a hard, dense silicious rock, having a semi-slaty structure. This rock is from twelve to twenty feet in thickness, and is succeeded by a thin strip of black slate, beyond which is found the crystalline limestone, which is a mile or more broad. It has a decided schistose structure near its contact with the clay slate.

The country rock is traversed by numerous large dikes of green rock (diorite) which have a strike usually about north, 65° east. These dikes are mostly older than the Bonanza dike which cuts them (the exception will be noted later), though sometimes appearing to be disturbed at the contact.

The Bonanza dike, as has been stated, is from eight to sixteen feet wide. Within this mass of intrusive rock there occurs, usually in the upper portion of the mine, three veins of quartz—one lying along the upper or hanging-wall side, one on or near footwall and the third in the center of the dike. The longitudinal extent of these veins has never been determined, as the workings have been confined almost exclusively to that portion of the formation along and adjacent to the four "crossings" and the black pyritous slate; therefore little is known of the Bonanza dike outside the limits of this richly spotted pay shoot, for it is a remarkable fact that the gold is found only within the limits of the pyritous slate zone, and then only along the fissures (crossings) at such points as will be explained.

In addition to the "crossings" is found another system of fissures, mere knife-blade veinlets, called "gold seams." It is at the intersection of a "crossing" and a "gold seam" that the pocket hunter hopes to find his reward, and he often does—a most substantial one. These "gold seams" lie out in the country rock—in this case, in the slates both above and below the dike. Their strike is quite uniformly 60° east of north, directly at a right angle to the strike of the slates. They all have a southeasterly pitch, but at greatly varying angles, ranging from about the plane of the horizon to nearly perpendicular. Strange to say, however, those found with an inclination of about 45°, seem to have been attended with the best results.

These "gold seams" cut down through the slates and other rocks reaching the hanging-wall side of the dike. They do not pass directly through the dike, but are usually found coursing in a more or less erratic manner on their downward trend through the dike to the footwall side, where the regular course is resumed in the slates. The gold seams within the limits of the dike are represented by narrow seams of quartz. Within the slate areas they are merely cracks.

The footwall and hanging-wall of the Bouanza dike are planes of displacement; a movement of about sixteen feet has taken place. It is a "thrust" fault, with a side throw of about equal distance—that is, sixteen feet. To make this more intelligible, we will assume the footwall slates, etc., to have remained stationary; the hanging-wall country has moved upward relatively to this footwall, a distance of sixteen feet and about the same distance to the westward, the dike simply separating the two massess. All of the rock strata, the crossings and gold seams seen in the hanging-wall country are found repeated in the footwall side, but with the displacement stated.

The pockets of gold in the Bonanza mine have always been found at the point of intersection of a "crossing" and a "gold seam," on the plane of the quartz veiu formiug the upper one of the series of three. This only obtains when the quartz was found in direct contact with the slates and not separated from them by a strip of dike material. This condition also applies to the footwall side of the dike. Some gold has been found in the central quartz vein, at the intersection of "gold seams" and "crossings," though far less than at the slate contacts. Perhaps the most remarkable feature of this wonderful mine is in the mechanical regularity with which gold pockets appear to have been distributed. I was told by Mr. Oliver, who for years superintended this mine and who knew its peculiarities well, that the pockets were found at alternate favorable points. Having found a pocket at the proper intersection of seams and crossings, etc., the next crossing would apparently have all the requisite conditions while no gold was found, but the next would be found to be the nucleus of a pocket. This peculiar fact has never been accounted for satisfactorily. The miners were satisfied to find a pocket, and they didn't trouble themselves about how it came there.

In the lower levels of the mine the three quartz veins found in the dike above appear to have united and formed a single vein two to four feet thick near the center of the dike, being separated from the slates above and below by six to ten feet of dike material, and, as a consequence, pockets of late have been both few and small.

The country rock has been greatly disturbed by the intrusion of a number of large diorite dikes, one of which is evidently younger than the Bonanza dike. The hope has been that by sinking deeper this disturbed region may be passed and that the same conditions found above may be discovered beyond with the rich deposits of gold.

Telephones for Mining.

Many difficulties attach to the use of the telephone in mining operations, not the least of which is the liability of the wires to be broken by falling rock or shattered in blasts. The apparatus itself is also attacked by many troubles peculiar to the situation. Yet the advantages of telephonic communication in a mine are numerous, and the service is now frequently resorted to. In the telephone sets thus used as little metal as possible is employed, and that little is carefully protected from exposure to the air. It has been found that for a set to be used in a mine, wood is the best material. It is creosoted and thoroughly covered with a waterproof paint. As far as possible all joints are dovetailed, or elaborately packed. As it is necessary to have the gongs for the bells on the outside of the box, as well as the handle of the magneto generator, the familiar crank and the little hammer between the bells enter the box through glands that are water-tight. The transmitter and receiver are also cooped up within the box, and connected with the outside by means of long flexible tubes, the interiors of which are of metal. It has been found that in this way the moisture is condensed on the sides of the long tubes, and little or none on the diaphragms. If exposed, the iron diaphragms would last but a few weeks; as it is, they have been made in this way to last an indefinite time.

Prospecting Enterprises in Nevada.

Some of our people, says Dan De Quille, are talking of striking out into the central and eastern parts of the State in April or May to prospect for gold. They will not look for or try to do anything with silver-bearing veins, unless they find pure metal on the surface. The miners who have small gold veins in the vicinity of Hawthorn, Silver Star and other gold-bearing sections are "making a live of it," and that is more than men are doing here who cannot get a place in one of the mines. It is seen that those of our people who go to these little gold camps seldom come back to the Comstock. As soon as they become acquainted with the nature of the veins they get a hold somewhere and stay. In all the gold belts where paying mines have been found there is a chance of finding other veins that will pay; besides, there are vast tracts of country that still remain to be explored. In many sections where there are mountains there are metals of some kind. This State offers a fine gold field for prospectors. There are probably veins here rich in gold that our prospectors would hardly look at. We here know nothing about any "gold ores," and pay no attention to any kind of quartz that does not show "free gold." There are probably ores here in many places that would pay well if worked by the new processes now being used.

"Some Mining Experts."

"What fools we mortals be."

To THE EDITOR:—Nature has shown what may be done under favorable climatic conditions in this far-western country of ours, not alone in the vegetable and animal kingdom, in forests unequaled elsewhere for individual growth and numeral extent, citrus fruits and garden truck, fast horses and handsome women, but another most prolific crop, not wholly indigenous to the soil, has not received the recognition due its attainments and unworth. This is the abundant herd of home-made, self-appointed "mining experts," who, within a few short months or years, without study or practice in school or field, are possessed of a depth of learning and a knack of reading the "great stone book of nature," truly marvelous to less gifted lifetime plodders in the mineral world.

Not alone is the layman in mining affairs, who is looking for an investment of his surplus coin, taken in, for the shrewdest of men, having no knowledge of mining, may be persuaded by the suave bearing and stock technicalites of the operator, but the profound indifference—to call it kindly—with which the mining public have acquired the faculty of absorbing any and all kinds of traveling "mining experts" passes belief. Given a high per cent of gall, an agreeable presence and conversational power—the stock in trade—they just drop in on a mining community either to expert (?) a mine or something with dollars in view, do a judicious amount of chin work and the native is captured. Now, to a tree-roosting Zaccheus, this is all very amusing and refreshing, but it becomes most monotonous when these people again and again—knowing they have been "done up"—keep on "kissing the rod." I doubt if a single mining camp of the West can claim freedom from this charge. Strange, isn't it, this Jonah's gourd variety of experts never gravitate to or care to know the leading mine superintendents or reputable mining men of known standing in a community, rather airing themselves on other subjects, barely touching on mining, with a half-concealed, half-revealed reserve of information that seldom fails to complete the capture of the unsophisticated listener in hotels and bar-rooms. Several known to the writer have acquired lungs and mining lore in this most delectable clime, possessing neither of moment when they got here.

The most delicious part of the whole affair is the bland affability of these ex-Counts, bee-herders, barkeepers, and what not, toward their admiring constituency and generally lack-luster-mentally admirers. The subject is very provocative of sarcasm and ridicule, hurtful as it is to legitimate mining, but where's the use; the general public may or might appreciate such a straying from the trail of mine correspondence, yet those for whom it is intended would smilingly and kindly pat themselves on the back and thank their precious God, "They were not as other men!" and apply it to the other fellow. Hence the casual reader will appreciate the difficulties under which the writer labors.

From where come these warts on the face of the mining industry, neither ornamental nor useful? All fields of business and grades of idleness are represented, though they are largely recruited from the whisky men; barkeepers probably have the first call. Generally the only public resort in a mining camp is the saloon. It is there men bring their ore samples to show improvement in development or talk over some new find. The "barkeep"—"fly" fellows as a rule, chronically opposed to manual labor—naturally gleans considerable information of the local conditions of ore deposits. He, if any one, sees through the veneer of the galvanized, itinerant mining expert, with the natural inference: "If that fellow is an expert I'll just try it a jolt myself." So he hies himself to some distant point and proclaims himself, and with his knowledge of human nature, acquired in "setting 'em up," and control of nerve and countenance in "standing pat on a four-card flush," he is apt to make it win.

A close second are store clerks from mining camps. What affinity there is between soap and sugar and the science of mining is beyond my feeble ken. Yet it must exist, else why so many graduates from behind the counter. Due credit should be given to the large contingent reaching from the saw-log expert of the Puget Sound to the bee vaquero and alfalfa brother of California and Arizona. The majority of this latter constituency simply mine-expert as a pastime, as a sort of lesser side issue to herding the festive bee or wrestling with the alfalfa or rutabaga problem.

Let us not forget the "Broker" and "Mine Promoter." These are slick talkers to people not familiar with mining. The "Counts" and "Dukes" of kindly advice (for coin of the realm), with a goodly (no pun) quota of ex-parsons, who certainly, having full power to down the devil, are qualified to best any earthly foe. They rank as generals, colonels and majors, never a lower rank, with a scattering of professors.

Now, many of these are bawling, noisy creatures, the loud-voiced recitals of their mining exploits, conveniently in some distant field, are in continual evidence. The whole matter of talk revolves around one central nucleus, i. e., the first personal pronoun. They toot their horn with a vim and continuity flattering to the lung-building power of our ozone-charged atmosphere. And, do you know, this brazen mouthing is really convincing to some otherwise sane people. Again others do the whispering act. They are the most dangerous, for, keeping their mouths shut and looking wise, they gather all the information possible in camp and build their reports thereon. All work any secret orders they may be members of for all that is in them, and it is a very strong card, you may be assured.

It would be well not to refer to the civil engineers, who think, because they are familiar with the working of a surveying instrument, they are thereby qualified to write themselves "mining engineers."

A civil engineer is no more a mining engineer than an ordinary engine driver is a machinist. A mining engineer, or "expert," presupposes an intimate knowledge, in the field, of mineralogy and mining geology, the method of attacking and actual development of any class of mines, a further practical acquaintance with mining chemistry, in fact, from underground surveying, the assaying and analysis of ores, to the brittling or tempering of drill or pick, and the placing of any or all mine timbers.

For this, a wide and practical field knowledge, added to thorough and constant study in books and leading mining journals, to keep abreast of the improvements and experiences of others, is essential.

In view of these varieties, and granting there are bright men interested in legitimate mining, grown gray in the service, who are often in doubt and hesitate to pass on the value of a mine, does it appear reasonable that others, having but a superficial knowledge of the business, probably acquired as manager, should be able to read the riddle of a mining proposition's future, if indeed of its present value. The following quotation is true to the letter: "There are belts and lodes of mineral in the earth that have certain limit, sure and certain manner of occurrence and regular deposition. Here the mineralogist and geologist step in and define them, toiling away until the rocks tell their own story of hidden treasure. By deductions the geologist locates mineral belts, natural gas, oil, marble and minerals." It is not to be forgotten that his theories have to be tried in the crucible of experience. Mining is expensive at best, and where wise, careful and competent advice is not had the chances are all in favor of failure and consequent harm to an entire community. Particularly is this incompetent advice disastrous in the inception of a mining enterprise in an untried field, where the highest degree of efficiency and experience is required. Just one bad break in a struggling young camp and its growth is retarded for years, if not damned eternally. In support of this assertion I refer the reader to his own or his neighbor's experience, if a miner.

TAYLOR D. MACLEOD.

Yuma, Arizona, Feb. 23d, '95.

An Old-Time Mine Hoisting Apparatus.

The man engine, familiar enough to underground miners of a generation or two ago, is fast becoming a relic, and many engineers there are to-day who have never seen one, nor even an illustration of one. With but few exceptions, in fact, at the famous Calumet and Hecla mines in the United States, for example, and in some of the old European mining districts, the man engine has long since been abandoned for the modern hoisting plant, and the experience of ascending or descending a mine shaft, platform by platform, or the steadily up and down going rods of the old-fashion apparatus, is one for which all opportunity will soon have gone. To the many who do not know the man engine, even by name, it may be interesting to be told that it consists of little more than a rod, vertical generally, though sometimes inclined, depending upon the run of the shaft, extending from the surface to the bottom of the mine, and moved up and down like a pump rod by means of a steam engine or a water wheel. The length of travel of the rod commonly adopted is twelve feet, and at intervals, equal to the length of the stroke, small platforms are fastened to the rod, while corresponding platforms are fixed to the walls of the shaft on either side of the rod, and at points correspounding to the limits of the stroke, both up and down.

A miner in descending, say, steps on a platform on the rod just as the down stroke begins, and steps off onto the platform in the shaft which he reaches at the lower end of the stroke, repeating the operation till he reaches his destination. In ascending, similarly, a miner steps onto a platform on the rod as the upward stroke begins and leaves it at the end of the stroke. Ascent and descent, as will readily be understood, may proceed simultaneously without interruption, the fixed platform on one side of the shaft being reserved for the men ascending, and those on the other side for the men descending, each man stepping on his proper platform on the reciprocating rod as it is vacated, at the moment of rest between the strokes, by the men going in the opposite direction. This form of single-rod man engine is even now in use in Cornwall, and in Scotland. In the Harz mines, in Germany, the birthplace of the man engine, the double-rod engine is in use, the two rods moving up and down alternately, in opposite directions, and, accordingly, carrying the men at twice the speed that can be attained with the single-rod kind. The apparatus corresponds practically to a ladder with movable steps, the miner having nothing to do but to move slightly sidewise in order to place himself on the step about to go up or down, according as he wishes to ascend or descend. Cassier's Magazine.

"Reporting on Mines," Etc.

To THE EDITOR: Discussing this subject in a recent issue of the MINING AND SCIENTIFIC PRESS, Mr. E. F. Schaeffle has a good word to say for the ordinary miner's report, while slightly reflecting on the more elaborate ones made by experts. Personally, I have very little use for the latter, but it does not follow that the average miner is a luminary on the subject of his own mine. Put an advertisement in a paper for a mine and see what descriptions you will receive from owners.

Most of them will consist of a few lines on a page or two of note paper, giving no information whatever, and asking you to "come and see for yourself." Mr. Schaeffle says, truthfully: The average buyer requires the "location of a mine; its situation as to roads and water power; the character of the ore; average width of the vein; length of the 'shoot,' with sketch showing developments; average sample of the vein, etc." If he has succeeded in getting these few simple requirements from owners, he has been more fortunate than I have ever been. One would think that a man living on his property for years should be able to enlighten you on these points, but my experience has been that he is not. In many cases I admit he has good reason not to tell the exact truth, but much of his reticence is also due to innocent ignorance. One who has been about mines much knows well how infatuated some owners become with their properties. I know of a case where a miner has been at work for nineteen years on a tunnel which he has driven in nearly 1000 feet on a broken or almost barren vein. Some time ago I visited a mine whose owner made a boast that it had been condemned by ten experts. I carefully sampled the twenty-nine-foot vein, with the assistance of that very owner, and found that the ore did not go seventy-five cents to the ton, and I have no doubt that the said owner has ever since been considering me as big a fool as the others.

The ordinary miner, even when acting in good faith, does not happen to be an authority on the quality of his own mine; but, unfortunately, his more intelligent and successful brother is hardly more satisfactory in this respect. If you ask the owner of a producing mine for data concerning his property, he will often demand a large sum of money to be put up as a forfeit before he will even talk. This is foolish. There are mine owners and mine buyers; these are thousands of miles apart, as a rule, and have rarely heard of one another. A party chances to be in California who might be the missing link between the two. He hears of a certain mine with a big (newspaper) reputation, and thinks it might be acceptable to certain bankers or syndicates he knows in New York and London. He applies to the owner in the way of business, and he is told to put up a deposit if he wants to negotiate. Why should be put up money on something he does not know anything about? People do not want a mine until they know what it is, and how can they know what it is unless the owner gives them the information or permits an expert's examination? Owners seem to think a mine is bought like a horse or a pair of blankets.

This is never the case in operations on a large scale, at least. There is no one single man who is ready to pay $500,000 or $1,000,000 for a mine. A large mine is always taken by companies, and to organize companies requires months of hard work, high financial influence, and a vast outlay of diplomatic skill. The usual history of a successful mining deal is something that people here know very little about, and is simply this: A promoter, middleman, or whatever you choose to call him, gets a report and an option (generally from sixty to ninety days) on a mine, and sends the proposition to his syndicate in the East or abroad. These proceed to expert the property and, if all right, make a partial payment for an extension of time, and then begin to work up a deal which will cost them from $25,000 to $75,000 before they get through. If it is not a "go," they are out this sum; and it is the expense that must be incurred in every venture of this character that makes it so difficult to get mines considered by capitalists.

There are no exceptions to this rule. The Josephine, the Union, the Ilex, the Valley Gold, the Sierra Buttes, and recently the Elkhorn, the De Lamar and Harqua Hala were all sold in this manner. It is amusing to read in the newspapers or to hear owners talk of the million or two millions they have been just offered outright for their properties and which they "refused," of course.

Mr. Schaeffle has done well to moot this topic, for it is one concerning which there is a great deal to be learned by miners, both obscure and conspicuous—especially the latter. ALPHA.

Men Whose Labor is Slowly Fatal.

That the conditions surrounding some of the trades knowu as unhealthy or dangerous have been mitigated by the appliances of science, is an undoubted fact. Still these cases are few, and in many instances, through the cupidity of employers, the safeguards which science has provided is neglected. Very often the workers themselves are the victims of their own recklessness.

Of the trades which tend to shorten life, the polishing and grinding trades have probably the most victims. Formerly the mortality of people who used to work in the needle factories was so great that special legislation had to be invoked.

The wages of these people were considered high. In fact, people are tempted hy high wages to engage in them, with a full knowledge that their span of life would be shortened.

The whirring, grinding machinery filled the air with metallic dust, which entered the lungs, no matter what precautions were taken. All kiuds of guards were tried and proved failures, until a frame-work of magnets to fit around the mouth and nostrils of the workers was invented.

This attracted the metallic particles aud ohviated the evil. The apparatus has been improved and modified until the trade is a fairly healthy one.

Brass workers are suhject to the same evil, but not to the same extent. Steel or iron being shorter in "grain" than hrass, sends more minute and impalpahle clouds of dust in the air when ground than brass. Magnets, however, will not attract brass dust, so that brass workers are short lived. In emery factories, where there is a constaut cloud of emery dust, various plans have been adopted to prevent the dust from entering the lungs. Noue of them has proved more than partially successful.

Knife and scissors grinders live short lives. Even if appliances are provided to reduce to a minimum the quantity of dust which euters their lungs, the workers grow careless themselves, just as people who are accustomed to walk on high scaffoldings become reckless and fall victims to carelessness.

Stone cutting and stone polishing, when the latter is dry polishing, comes under the head of the dangerous trades. Though not as bad as knife or scissors grinding, still particles of the stone dust find their way into the lungs, which means consumption sooner or later.

The trades connected with the mauufacture of chemicals. paiuts, the use of paints and the grinding of colors carry thousands of victims away every year. A labor leader who has given years to the suhject of these trades, says: "Few people can realize the enormous number of deaths all over the world of people engaged in just such trades. No statistics that were ever collected could do justice to the fact. Why do they choose such trades? you ask. All I can say is that 'all men think all men mortal but themselves.'

"In some of these trades the wages are not even tempting, but people have an idea that they will he all right. All lead trades are bad; they poison the blood, but some people are more susceptible to lead poisoning than others. Printers all know what 'printer's colic' is, coming from handling the type.

"I have known of men particularly susceptible to lead poisoniug who have been paralyzed in one or both arms from handling types. This is not a very commou case however.

"Minerals which are liquid or semi-liquid are the worst," he continued. "They are breathed and taken into the lungs and carried through the blood. Arsenical paints, through their vapor, find their way iuto the lungs and stomach. The wearing of wet sponges before the mouth and nose somewhat ohviates this."

One of the most terrible trades in its effects is the making of matches, or work in which phosphorus and sulphur are used. Efforts have been made to render it less dangerous, but science can do little, though the increased use of machinery has rendered the evil less than it was. A man seen on the subject, who was once superintendent of a match factory, said the fumes of the phosphorus act on the teeth and jaws so that the teeth loosen and fall out. Then the jaw swells and the gums dry up. The hones of the jaw become hrittle, and at last the bones hegin to drop out iu pieces. Occasionally the skin swells and the bones drop out through the skin. Some can stand it better than others.

Asked if there was any safeguard, he said: "The ouly safeguard is care. It is a dangerous trade, but people can make it less dangerous by avoiding the inhalation of the fumes. Some people used to die in five years, but more care is taken now."

Another trade which used to carry off many victims is glass hlowing. Glass blowers inhale hot air, which gradually wears away the delicate mucous covering of the throat and lungs and death ensues.

Dye works also contribute their quota of victims from lives shortened by inhaling chemicals.

It might he asked how it is that so mauy healthy people can he found in these callings. The answer is that there are people who are less susceptible to such poisoning than others.

Recklessness is the great destroyer of life. A little common sense makes some dangerous trades measurably safe, and the want of it increases the danger.

In the building trades the housesmiths take the greater risks. There is nothing in the work to necessarily shorten life except that accidents occur, but they are so frequent that the trade is dangerous.

Any one who looks up at the iron skeletons of any of our great sky-scraping buildings in process of construction can realize this. Men ou giddy heights are stepping from beam to beam when a single false step would mean iustant death. So slight is the balance sometimes that a sudden gust of wind or a wet, slippery spot trodden would cause a worker to lose his balance, and a terrible death is his fate.

The list could be lengthened indefinitely. In nearly all trades which could be called dangerous independently of those which would be called uuhealthy, the habits of the worker have a good deal to do with his chance of longevity.

Carelessness and recklessuess have caused more deaths thau all the primary causes combined in the dangerous and unhealthy diseases named.

About Gold Mining.

A Deuver mining mau, in a letter to an Easteru paper, makes a few pertinent remarks on the business of gold mining in his State, which applies in general. In giving emphasis to his statement that success in legitimate mining depends as much, if not more, on business ability than science, he says:

Occasionally there will be met with a rich gold mine which will stand for a brief period that kiud of reckless and extravagaut management that would send the chills down the back of a conservative Boston business man. These mines are few and far between, but their very existence does more harm than good from the fact that the methods applied in their management are also tried on other properties, which, while possessing large wealth in gold, are not of such a nature as to stand this kind of "kid glove and champagne" management, and hence the enterprise invariahly ends disastrously, and a valuable miue is abandoned as worthless.

All over the western mining country there are old gold mines with millions of dollars in low-grade ores, which were abandoned years ago at the time the silver excitement spread its allurements to the miner. At the present time our conservative and wide-awake mining men are quietly securing control of such properties as these. They are equipping them with moderu plants of machinery and erecting works for the reduction of their ores by the proccss or processes which have proven to he the most adaptable to the husiness of extracting gold from just that class of ores.

They are not earning fabulous dividends nor are they losing anything, but they are earning those dividends which could reasonably he expected from any legitimate manufacturing enterprise. This is mining and business combined—the kind of mining that furnishes employment for competent mine superintendeuts, business men and metallurgists, who take large interest in their work of producing gold for Uncle Sam without question of loss or chance. In this kind of mining you will not find the speculator or expert.

So now if your Boston or New York capitalists want to make miniug investments, not speculations, go to the experienced western mining man, tell him what you have to invest, and above all, impress ou him the fact that you have no money for speculation, but wish to engage in some legitimate enterprise as a business venture with as little of that element "chance" to enter into the transaction as is possible. If your mining mau (don't call him "expert," the name applies too much that is not complimentary in this western country) understauds his busiuess he will get you a mine with ore in it, hut probahly of such low grade that it will take considerahle money to place it on a paying basis. There are hundreds of such mines in the West whose owners know the value of their properties, but are too poor to work them themselves, and seldom find an opportunity to sell, for the majority of buyers are speculators only and are frightened away by the preliminary outlay necessary to "open up" the mine. When you have your mine in view it is no difficult matter to estimate its real value, the amount to he expended for development and the value of the ore bodies, working, costs, etc.

The only actual risk run is the sudden "playing out" of the ores in the mine, due to more or less geological peculiarities for which our Creator is alone responsible.

THE register and receiver of the Redding Land Office puhlish a notice to miners that the C. & O. R. R. intends applying for patents to the SE¼ of section 3, and all of section 11, in towuship 33 north, range 7 west, and S½ of NE¼, section 1, township 32 north, range 8 west. Parties interested have 60 days in which to protest. It's only a little matter of a million acres. The California Miners' Association will file a protest this week.

Protecting Mineral Lands.

Earnest effort on the part of the Committee to Protect Mineral Lauds, appointed at the recent convention of the California State Miners' Association, has checked the process of wholesale transfer of mineral land to the railway companies. The latest attempted grab is reported from Redding, where about 1,000,000 acres are involved. The committee is hard at work, and their lahor is for the public good in preserving the public domain from unjust absorption. The following address is issued, which tersely sets forth the facts:

To the People of California:—The efforts of the California Miners' Association to protect the mineral land within the railroad grants in this State from heing patented as agricultural lands under the rules of the Department of the Interior, dated July 9, 1894, require the expenditure of large sums of money. Maps intended to show graphically the relative position of mineral belts, mineral entries and locations and the railroad lands are heing prepared. An agent of the Association is employed at Washington to further its interests and to secure favorable action in Congress and the Land Department in the matter of the preservation of the mineral lands to the miner and the prospector. The Committee on the Protection of the Mineral Lands is compelled to gather about it a corps of assistants, which must be paid for its services.

So far this committee has filed, or is about to file, protests against railroad selections in this State involving more than 1,500,000 acres of land, all not necessarily mineral, hut all of which, in the absence of protest, would he patented to the railroad companies as agricultural land, irrespective of their true character and the possessory rights of mineral claimants thereto. Hearings to determine the issues raised by these protests will shortly he ordered in the respective land offices wherever such lands may be situate, and unless such protests are supported by proof made at the proper time, the whole matter will go by default, and title to these lands pass to the railroad companies.

The orderly presentation of the cases will demand considerable outlay of money; it can be obtained only by voluntary subscriptions, and the California Miners' Association now appeals to the people of California to give it substantial pecuniary aid in maintaining this, the first systematic and effective effort to protect the mineral lands within this State for the uses of the prospector and the miner.

The Association does not seek to deprive any railroad company of any lands granted to it, hut it denies that mineral lands are included in such grants, or that the Department of the Interior can properly promulgate rules to arbitrarily determine the character of lands lying therein, and by so doing abrogated the laws of Congress and the decisions of the courts. But mere denial is one thing; to substantiate these rights is quite another thing. For the latter the money is needed. To the end, therefore, that full justice may be done in the premises, the California Miners' Association respectfully asks for contributions to this cause.

San Francisco, March 1, 1895. A. H. RICKETTS,
Cbairman of the Committee on the Protection of the Mineral Lands, California Miners' Association.

The PRESS has had so much to say about this matter that it can only reiterate the manifest necessity for the present movement and urge immediate and substantial response to the above appeal. This is no charity matter. Miners' rights, the public good, are endaugered; it is for miners and the public generally to supply with the sinews of war those who are making the fight. If they fail it is the public's loss. To he successful they must have money, not for salaries or fees, hut necessary expenses incurred.

Personal.

PATRICK KERVIN bas gone to Sonora, Mexico, to examine some gold properties for JNO. W. Mackay.

S. S. BURT, a Chicago man who has been looking for South American gold mines, is in the city with alleged desire to huy a California gold mine for some capitalists of his city.

DOCTOR THOMAS ADDISON, manager of the General Electric Company, sailed for Honolulu on the 13th ult. for a brief business trip. He is expected back the first part of next month.

CAPTAIN ALEX. THOMPSON has purchased tbe Alaska *News*, published at Juneau, of W. H. Carpenter. Mr. Carpenter has the gold fever and will soon go up tbe Yukon river in scarch of the yellow metal.

THE Bigsby medal has been presented to Prof. C. D. Walcott, Director of the United States Geological Survey, hy the London Geological Society for his valuable contributions to geology and paleontology.

JOS. CLARK, who recently resigned the superintendency of tbe Poorman mine, has taken charge of his brothers' property at Trail Creek. The Le Roi Mining Company, at Trail Creek, has secured the services as superintendent of Geo. Bent, recently in charge of the Bunker Hill and Sullivan mines at Wardner, Idaho.

Obituary.

H. A. ADAMS, a native of Grass Valley, and a well-known California miner, died Jan. 25 at Johanneshurg, South Africa, where he had for some time been resident accountant at the Simmer and Jack mine.

Book Review.

SCIENTIFIC LECTURES, by Ernst Mach, Professor of Physics in the University of Prague; translated by Thos. J. McCormack. The Open Court Puhlishing Co., Chicago.

The "popular science" idea does not receive customary recognition in this book of 300 pages. Yet those who seek popular science, which is simply organized knowledge simply set forth, could find much to interest and instruct in this admirable translation of twelve fine lectures on sundry scientific subjects. Two of the twelve—The Conservation of Energy, and, On Transformation and Adaptation in Scientific Thought—are good examples of abstract reasoning, of surprising originality. Such subjects as "Why Has Man Two Eyes?" "The Velocity of Light," and "The Fibres of Corti," clearly and pleasantly discuss more concrete phenomena. The hook is worthy a place in any scientific library, and the translator deserves a word of praise for his idiomatic skill in rendering the German expression into our English form of speech.

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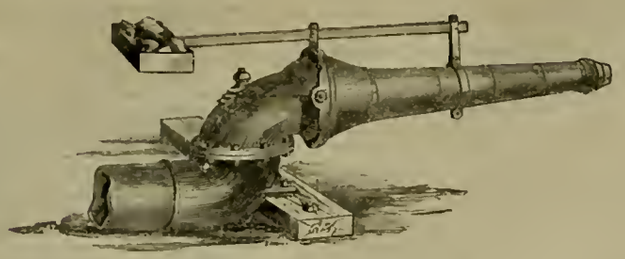

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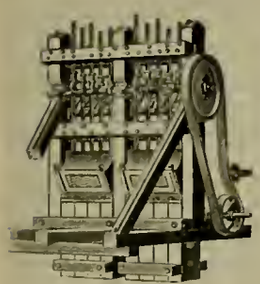

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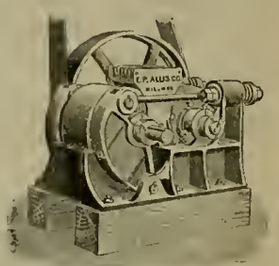

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The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XXIII.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

Natural gas in California was known to the Indians before the coming of the whites. The gas spring at Sulphur Creek, Colusa county, aud a similar one in Mendocino couuty burued at intervals, lighted by accident from their fires, and continued to flame until another accident extinguished them. It is not known that the Iudians regarded this natural phenomenon with superstitious or religious interest.

The first account of inflammable gas below the earth's surface in Califoruia, I have found recorded, dates back to 1872. It states that a man named Cook was working in a mining shaft near Sutter City, Sutter county, prospecting for coal. A blow from his pick was followed by a flow of gas, which, igniting from his candle, exploded with great violence. The shaft was filled with flame, which rose to the surface of the ground. The windlass was blowu away and Cook was with great difficulty rescued by his mates. (Marysville *Appeal*, quoted by the MINING AND SCIENTIFIC PRESS.)

Emanations of natural gas are common in California. Those most frequently met with are carbonic acid, hydrosulphuric acid and carburetted hydrogen. The first is abundaut in the solfataric regions, and is generally associated with ores of mercury. Hydrocarbous are also found in some form in nearly all kuown quicksilver mines. In California their preseuce interferes very materially with the metallurgy of mercury. Being volatile like that metal, they sublime with it and are found difficult to separate. During the first workings of the great "sulphur bauk" near Clear Lake, the greatest difficulty eucountered iu refining was the presence of mercury, which blackened the sulphur when attempts were made to purify it.

Owing to the solfataric energy the heat in some of the Califoruia quicksilver mines is oppressive, aud the gases generated are daugerous. Raynal has called attention to the same peculiarity in the Idria mine in Australia. "There are places where it is so hot that if one stops ever so short a time one is in a profuse sweat. It is from these subterraneau caverns that mercury is drawn." (History of Settlements and Trade in the East and West Iudies, vol. II, fol. 540.)

Carbonic acid gas is so abundaut in some of the quicksilver mines iu California, notably in Napa, Lake and Sonoma counties, that exhaust apparatus is employed to clear the galleries and shafts so that the miners can work. Small animals have been known to die from the effects of this gas overflowing from the shafts of the miues. Bubbling gas may be noticed in the beds of streams aud shallow basins of water. It no doubt escapes in the same manuer on the dry land but is not uoticed. Over the entire surface of Clear Lake bubbles of rising gas may be seen, aud the great gas fountaiu at Soda Bay causes the water to boil like a cauldrou. This gas, without proof, has been assumed to be carbonic acid, which most likely it is, but it may be carburetted hydrogen or illuminating gas.

There can be uo doubt that the agencies which have produced older deposits of mercury are still iu active operation here. In Pope valley, Napa county, a small stream passes very close to old workings; aud in shallow pools, caused by slight obstructions in the bed of the stream, the bubbling of gases may at any time be seen. This locality has recently gaiued quite a celebrity as a source of a valuable mineral watcr, and the shaft of the old "Valley quicksilver mine" is now the "Etna springs." I have frequently been many feet below the level of the present surface of this now well-known mineral spring.

There are about one hundred known mineral springs in California to which more or less attention has been drawn. All are engaged in geological and chemical work. The peculiar conditions under which they exist give them the character which distiuguishes them from others, and the waters always hold in solution a large perceutage of mineral constitueuts, some of which are made more solublc by the presence of absorbed gases. They are frequently saturated and sometimes supersaturated. At one point in their passage through earthy strata they take part in the decomposition of older rocks, a portion of which they convey in solution, and deposit minerals of a different character at another far distant. The labor of this active agent is seldom realized even by the practical geologist, much less by the casual observer. Not only do these waters deposit vast quantities of distinctive minerals, but they furnish cement to form elastic rocks, which are thus changed from loose fragments and sediments to solid rock masscs.

There is a mineral spriug two miles south of Salmon creek, iu Monterey county, which is sour. It is said to be the custom of those who reside uear to add sugar to the water and drink it as lemonade. A mineral spring on township 24 south, range 5 east, in the same county is called "the Devil's spring" and "the Poison spring"—the latter because small auimals are frequently found dead on its margin. It has beeu discovered that the water is not really noxious, but that animals die from inhaling carbonic acid gas, which is evolved in large quantities. This is illustrated by an experiment frequently made. A large bundle of dry wild-oat straw is iguited, and, while burning fiercely, is held over the spring, when it is immediately extinguished. Like most of the mineral springs iu California, this one is near a quicksilver mine, and is itself au active solfatara.

There is said to be a poison spring in Mendocino county, which is described in a recent newspaper article, from which I quote without responsibility for its truth.

"The spring is situated about three miles from Hoplaud in a clump of stunted trees. The water is clear and colorless and makes a hissiug noise as it issues from the ground. The bodies of many small animals lie near its margin. There rises constantly from the spring a gas so noxious and deadly that one whiff is sufficient to extinguish life. On one occasiou a girl of six years wandered from home aud was found dead at the spring with the dead body of a bird in her hand. She had probably seen the bird at the margin of the spriug, and, stooping to pick it up, had beeu overcome by the gas. There is also a story of an Indian squaw who lost her life while stoopiug to drink the waters. The writer complaius that there is no fence built aronnd the spring or warning notice posted."

It is generally assumed by chemists that all carbouic acid has at one time been combined chemically with other elements or compounds, aud that it is the result of this that those eternal changes are continually taking place in nature to which all life aud energy are due. It has been set free, in the languagc of the chemist. Whether this is uuiversally the case or uot, it cannot be doubted that when it escapes from the surface, as it does iu California, it results from decomposition of minerals in subterrauean rocks.

Issues of carbonic acid gas are common iu the vicinity of volcanoes, aud where volcanic rocks exist it is supposed (perhaps erroneously) to be the result of the remains of extinct volcanoes. Grotto del Cane, near Naples, is a noted example.

This is a small cavern between Naples and Pozzuoli, iu Italy. It is so named because if a small dog is brought in he soon becomes insensible, but soon recovers on being takeu without delay into the fresh air, or deluged with water. The grotto in artificial, having been excavated in mining for pozzuolana. It is only twelve feet in length and four or five feet wide. An average man can stand in it without bending; the lavas forming its walls are compact, of a dark gray color; they are somewhat magnetic.

The grotto lies near Lago d'Agnano; it probably existed in Pliny's time. The waters of this lake were formerly agitated by emanations of bubbliug gases, but this had ceased in 1788; near by were the "stoves of St. Germauo" and the ruins of bathing houses, with tubes of terra cotta for couveying hot water and hydro-sulphuric acid gas, called "hepatic vapors," still in place. The mephistis in the grotto of Del Cane is so mixed with atmospheric air that phosphorus and gunpowder burned in it, as proved by Breislak's experiments in 1788. Spallanzani came to the conclusion that the carbonic acid was generated by the action of volcanic heat on decomposing lime rocks below the surface.

That author and traveler also visited the grotto iu 1788; in 1790 Abbe Breislak sent him a communication, which, quoted in full in the first volume of his travels, recites a series of experiments made in the grotto. The depth of the gas (called by him also "mephistis") on the floor of the cavern was found to be eight Paris inches. He also convinced himself that the gas was carbonic acid gas mixed with atmospheric air.—(Travels in the Two Sicilies, Vol. I, fol. 90.)

Daubeny thus refers to the nature of the emanations in Grotto del Cane: "The sensation I experieuced in stooping my head for a moment to the bottom resembled that of which we are sometimes sensible on drinking a large glass of soda water in a brisk state of effervescence; the cause of which in both cases is plainly the same."—(Descriptiou of Active aud Extinct Volcanoes, fol. 173.)

Grotto del Cane is specially interesting only because it was the first example known, and because it has been so often described and referred to in history. The conditions found in Italy are not rare, but exist in numerous places in other parts of the world, including California.

There is an engraving of Grotto del Cane in "Observations Upon the Antiquities of Herculaneum," by M. Bellicard, 1753, planche 27, and also a full description ou folio 122 of the same work.

(To be continued.)

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Mechanical Progress.

Economy of Power-House Operation.

By J. B. Craven.

"Economy of Power-House Operation" has been so often and so thoroughly discussed that I do not know that I can say much that is new on the subject, and yet being one that must ever come up before the management of a street railway system. Starting from the boiler room, we come at once to the place where, in most cases, the greatest waste will be found. It has been said that the waste due to improper firing is often of greater consequence than any other loss which is produced in the operating of a steam plant. There are two causes for this: First, poor construction of the boiler; second, poor firing and lack of care of the boilers. Most of us think that any man can fire a boiler; and while looking with awe and wonder at the engine and generator, forget that all the power comes from the coal pile, and pay little attention as to the economy in transmitting that power from the coal to the engine. No greater mistake is made than to place the care of boilers in incompetent hands, for they require the highest degree of care, conscientiousness and constant attention.

The fireman must be ever on the watch to see that the water is kept at the proper level to keep an even steam pressure and to show by his steam, coal and water records that he is getting just as good cards as the engineer can show by the manipulation of the steam he uses in his engine. He must see that the fires are spread evenly over the grates and are of an even thickness, that the proper amount of air is admitted into the furnace to obtain good combustion.

If you could realize how easily from one to twenty per cent of coal can be shoveled into the furnace and up the chimney without generating any more power, you would see how essential it is to have something more than mere machines shoveling coal into a furnace. Another point of importance is to see that boilers are kept clean and free from scale, which is simply the result of improper attention.

If for a moment you will stop and think that in the construction of the boiler the maker has reduced the thickness of the tubes as much as possible consistent with safety, and then look at a tube with from one-eighth to one-half an inch of scale on it, you will at once see how great the loss must be transmitting the heat through this scale. Not only that, but it leaves the iron exposed to the effects of the heat without the proper circulation of water back of it, which causes rapid deterioration, and in some cases is liable to cause an explosion. I have used quite a number of boiler compounds for the prevention of scale, but have found the best to be plain coal oil. We have used it in Buffalo for the past two years with success, putting about one pint a day into each boiler and letting it enter with the feed water by means of a sight-feed lubricator. However, no one remedy will fill all cases, and each must be the subject of some experiment.

Another source of loss comes from insufficiently covered boilers and pipes. See that all exposed parts, that possibly can be, are covered with some good non-conducting material, and prevent as much as possible radiation and condensation. The steam pipes should be kept tight and all leaks followed up at once and stopped, and in this way have as little loss as possible between the boilers and engines. See that the piping is well drained, so that water will not carry over the cylinder of the engine. This is accomplished by separators placed as near to the engine as possible, and the water thus separated is returned to the boilers. In a good many cases this water is allowed to go to waste; if this is found to be the case, it should be remedied, as this water is separated at a very high temperature, and requires very little heat to turn it again into steam. Before entering the engine-room I would like to say something on the subject of feed-water heaters. If your engines are running non-condensing, the question is very easily settled. As, however, the majority of steam plants are run condensing, other factors are brought in. In the power-house of the Buffalo Railway Company, one-seventh of the engine capacity is run high pressure. In this way, taking the feed water from the hot well at an initial temperature of 110°, and passing it through two heaters in the exhaust line of the high-pressure system, we get a final temperature of 194° before the water enters the boilers. It is claimed by some that this method of taking the water from the hot well is not right, on account of the oil to be found in this water. But so small a portion of the hot well water is used that the amount of oil in it is small, and by this method we do away with secondary heaters in the exhaust line, between the engine and condenser, and not only save in the first cost, but I think obtain slightly better results. However, one thing is important—whatever means are used to heat the feed water, it should be done, for not only will there be a great saving in fuel, but the straining of the boilers due to putting cold water in will be done away with.

Passing from the boiler room we come to the engines and generators, and the types seen here will be many and varied, from the high-speed, belt-driven machine to the slow-speed, direct-connected machine of large units. As you all know, the tendency of late has inclined to the use of the latter type. In my mind there is no doubt of the efficiency of the direct-connected unit over the belted one. It is evident to all that where space is valuable it has the advantage of taking up less room. They can be thrown in and out of service with as much rapidity as the belt-driven machine; there is a saving of one and one-half to three per cent, due to the slipping of belts, very little in itself, but when figured up at the end of a year in a plant of any size will amount to considerable.

Added to this there is the saving in labor and the decreased expense due to wear and tear, as this item is less in slow-speed than in high-speed machinery. For the above reasons I have drawn the conclusion that direct-connected units are more economical than high-speed ones. Regarding the size of units used, it depends entirely on the output of the plant. I would advocate as large as possible, yet not so large that the breaking down of one would cripple the output. However, in plants that have not these latest types of machines, great saving may be made in the operating of the engines. In many cases, after the constructing engineer has left, engines are oftimes supposed to look after themselves, those in charge simply supplying them with steam and oil. What I said in reference to the man in charge of the boiler room applies with equal force here. Put a thoroughly competent man in charge and you will find it a paying investment. Intelligence and experience are the best safeguards and the real insurance against accidents. Fifty dollars a month more to a capable engineer will probably be repaid a hundred times by the care taken and the high state of efficiency at which the machinery is kept. In such a state an engine is a reliable piece of mechanism. If neglected it is liable to fail at any time, causing delays and worries, and not only adding to the expense in the cost of repairs, but a loss in the receipts outside.

A capable engineer will see that his engines are indicated at least once a month, to see that the valves are properly set, and so keep the steam consumption down to a minimum. All pounding, knocking and leaks should be followed up and remedied at once, and the engines kept in such a state as at all times to be ready to perform the severest service exacted of them. Always keep the load as near the normal capacity of the engines as possible, as engines at that point are most economical; besides, you will have fewer machines in service, and thus save in the oil supply. Here I will say a little on the subject of oil, as I think quite a saving may be made at this point. In fact, I have had one engineer use $640 worth of oil more in six months than another engineer used in the same time, and the engine capacity was increased during the time the last man was in charge. The lowest-priced oil is not always the cheapest; some oils will go much further than others, and the question of what to use should be settled only by careful examination. After being used once it can be filtered and used again on the lighter parts of the machinery. If rags are used for wiping instead of waste they can be washed and used again, and the grease and oil extracted will be found useful in some part of the system. By washing the rags eighty per cent can be saved over what the cost would be if only used once and thrown away. Coming to the generator, we find a machine that is usually well made and efficient. Keep them dry and thoroughly clean, and have the commutator kept as smooth as possible. The principal trouble will be found in the sparking of the brushes and the heating of the armature and the field coils. The causes of these troubles are too many to enter into here, but on the appearance of trouble the machine should be stopped as soon as possible, for the old maxim "A stitch in time saves nine" can be applied here. Keep the minor electrical apparatus in a station. Everything, such as switches, connections and all instruments, should be kept clean and in working order, especially in the case of lightning arresters, as they may be the means of saving an armature.

Three-Cylinder Simple Locomotives.

The use of a third cylinder on a locomotive, where the latter is a compound engine and the steam has two chances to expand, is no novelty. Such a plan is quite common in Europe, but a three-cylinder locomotive of the single expansion type is much more unusual, and, indeed, was unknown until quite recently. It is an American invention, too. About ten years ago it was found that stationary engines in the coal regions, employed to haul cars up a steep grade on short inclined planes, would pull more steadily if three cylinders, working cranks 120 degrees apart, were resorted to than would those with only two. The idea was conceived by the late John B. Smith, president of the Erie and Wyoming Valley Railroad Company, and was put into practice by him. He did not expect to get more power from the same steam, but to apply the power more evenly. The work of a piston depends on the leverage which it gets on the crank, and this varies during the stroke. By the proposed change it was hoped to get a better distribution in the general result. The experiment so fully justified Mr. Smith's expectations that the principle was applied to several small locomotives. These, too, developed the same qualities as the stationary engines; and now, within two or three years, six large engines, mostly for freight service, have been built with three cylinders.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GOVER.—*Republican:* The water is still heing kept out hy means of the electric pump. W. T. Hale, of the Keystone, resigned his position as superintendent on the ground that he was not ahle to attend to it. Wales Palmer is now in charge of the property for J. M. McDonald. The sheriff's keepers are still in charge under the attachment suit. Word was sent up to the superintendent last week to start up the mine. This can hardly be done without settling the indehtedness, and from these instructions the inference is that there is some prospect of a settlement.

ANITA.—Tbe miners are again laid off; too much water, which cannot be controlled by present facilities. The superintendent proposes putting in a steam pump.

ALMA.—The new hoisting machinery from the Risdon Iron Works is all on the ground, and, with the exception of a few pieces, is all in place. It is a douhle-cylinder engine, 100-horse power. Everything in connection therewith has heen done in the most suhstantial manner.

THE KEYSTONE.—The Keystone mill was started yesterday morning, after an idleness of only seven weeks as a result of the fire. This is the quickest resuscitation for a quartz mill on record in this county, especially considering that the work had to he done in the dead of winter, when material is difficult to get.

Inyo.

DRY PLACERS.—Placer gold was discovered near Independence in paying quantities twenty years ago, hut at that time the miners, where they could not ohtain water, had to haul or pack their dirt, but with the dry washer those diggings are now heing worked. Gold was discovered last May in Mazourka canyon by some Mexicans, and ahout thirty men have heen engaged iu mining there ever since. This discovery led to others, and now there are a number of places where gold has heen found in paying quantities. The gold is found in the Inyo range of mountains, although not very rich or very extensive, yet in the aggregate a considerahle quantity has been taken out, and from present indications more will he taken out the coming seasou than there was last. The season for dry washing will commence in May and last until the first rains in the fall, prohably Novemher, when it must cease, as the ground gets too wet to he worked hy that process.

E. C. Garlick, superintendent of the Argus group of mines, has concluded all the arrangements for water and mill sites and has gone out to Snow's Canyon with a supply of provisions and tools.

Nevada.

RICH QUARTZ.—Some remarkahly rich quartz is heing taken from the Trevaskis ledge near Indian Flat. Eight pans of rock, weighing in all ahout 160 pounds, was pounded up a few days ago and yielded $219.43, the gold being worth $17.09 per ounce. This is the mine on which Prof. George A. Treadwell bas a hond, and is endeavoring to get English capitalists to buy the property. A *Transcript* reporter was shown a pan containing a prospect obtained from nine pounds of quartz. The bottom of the pan was covered with gold, scattered all through the fine dirt and sand. It was estimated that there was about $40 worth of gold in the pan. Mr. Treadwell intends sending this prospect to England without removing the dirt or small pieces of rock that were left, in order that the parties who are thinking of buying the mine may get a hetter idea of what the rock contains. The quartz was taken out ahout eight feet helow the surface, and the vein matter is ahout eighteen inches thick.

DRIFT MINING.—At the Odin drift mine, a short distance north of Nevada City, tbe tunnel has been driveu through 90 feet of granite, and it is calculated that ahout 100 feet more will have to he run hefore the channel is reached. The indications are encouraging, and it is helieved that a large deposit of rich gravel will he found when the channel is struck. The tunnel at the East Harmony has heen extended 100 feet, and a raise of 40 feet made. Some splendid gravel is heing taken out.

THE RICH MARYLAND. — *Telegraph:* The Maryland Mining Company has heen having considerahle trouhle with water and pumps of late, hut now all is serene and the men all went to work. The new find in the 16-foot level is proving to be exceptioually rich. Men who have heen working there for years say that they never saw anything like it before.

HAGUE'S BIG ENTERPRISE. — *Herald:* On Monday hegan the survey for the proposed pipe line from the Empire mine to Massachusetts hill, in Grass Valley district. Mr. Hague's contemplated operations in that district will involve an outlay of at least $100,000, and it is said that the work will surely he commenced this spring.

RIDGE MINE.—Richard Phelan, the superintendeut of the Gold Ridge Con. Miniug Co., whose property is located on the San Juan ridge, writes to the *Herald* that the company owns 200 acres of ground; that they have a good natural dumping ground which cau be prepared at moderate expeuse to hold their debris for three years, and that they will he ready to hydraulic by next June. The company will also erect a quartz mill, as the property includes four quartz claims. The gold in the gravel claims comes up to the grass roots, and there is no foreign rock or anything else hut hlue gravel, apparently with very little cement. Such a mine ought to prove a fine gold producer.

Shasta.

A GLOWING ANTICIPATION.—From Redding it is asserted that "the new company which recently hought the Iron Mountain mine are straining every energy in the preliminary work, preparatory to huilding a hroad-gauge railroad to the mine and securing a site for the great copper-matting smelter—the largest on the Americau coutinent—which they hope to have in operation hefore the 1st of October. The capacity of their plant will not he less thau 1000 tons daily; mayhe 1500 tons of Iron Mountaiu ore. That will give a local market for 250 to 300 tons of silicious ores that other mines will produce.

"It will put from 12,000 to 15,000 men to work in the hills around Redding, and give her fruit-growers a splendid local market for their orchard products. In three years, or less, Redding will he leading Butte, Moutana. This is no fancy dream, but it is a reality which this great reduction plant guarantees.

"The company's attorney, who came out from New York to attend to the legal matters, says Shasta will he the greatest metal producer of the Pacific coast inside of three years. Just think of a mine showing a hreast of ore 700 feet wide, that will average from ten to thirty per cent copper, thirty ounces in silver and $3 in gold! That is Iron Mountain."

Siskiyou.

MINING NOTES. — Yreka *Journal:* The Greenhorn hlue gravel mine, ahout a mile south of Yreka, seems to he improving in its gold yield, hy the drifters reaching richer gravel, and obtaining a greater ahundance of water for more successful operation in sluicing, siuce the weather has become warmer to melt the snow on the mountains. The cleanup last week amounted to $1326, and will prohahly average that amount steadily from now on, the greatest drawhack heretofore being the scarcity of water for washing.

The river miners in the Honolulu district, of Klamath river, will soon commence getting timhers and lumher ready for wing-damming, hut it will he some time yet hefore anything can he done in this respect at Oak Bar and Hamburg, farther down, in the vicinity of Scott river.

Great preparations are in progress for extensive mining operations at South Fork of Scott river, and around Callahan's. The Enterprise Co. is huilding a ditch two miles in length to their claim on Wild Cat, and the Scott River Mining Co., at South Fork, is also busy getting ready. Other mine owners are doiug likewise. When under full headway, many men will he employed, as the great amount of suow on Scott mountain, to keep up the water supply, will enable the companies to work full handed in sluicing down the great hanks of auriferous gravel in that rich mining district.

MINE BONDED.—*Journal:* Messrs. Hunter and Nolton have honded the mining ground of Quinue & Simmons at Hawkinsville for $20,000, and are to pay Quinne $2000 additional for an equal share in his electric light plant ditch, for extension of same farther down Shasta river, in obtaining greater fall as power in operating a 200-horse power pump. This pump will be used in raising water some 400 feet, for supplying a ditch with 300 inches of water, which will be built from a reservoir at top of the hill above the electric light works down to the diggings at Hawkinsville.

THE BLUE GRAVEL MINE.—The Blue Gravel mine, Greenhorn, has twenty-five men at work. They clean up from $1300 to $1500 a week.

Trinity.

NEW RIVER.—This camp needs transportation facilities. The nearest point of supplies is Callahau's, forty-five miles distant. The Denny & Bar Co., during the summer season, keep a pack train between Callahan's and New River, which last year made 12 trips to New River, carrying 100,000 pounds of freight.

Probahly the best mining property in the quartz line is a new discovery, known as the Surprise, made a year ago by A. O. Fulmore & Co. They have made only one crushing of about forty tons of quartz, which proved immensely rich.

The Mountain Boomer, which a few years ago had heen almost sold to John Daggett for $50,000, has, since its discovery in 1885, as mint receipts will show, yielded an aggregate of $200,000, and is still in good paying condition.

The Sherwood mine, which at present is in the hands of the Prohate Court at Weaverville, has also since 1885 produced not less than $150,000.

The Hard Tack, Tough Nut and Excelsior are three more mines of tbe old discoveries made when the camp was in its infancy in '85, which come next in gold production.

TRINITY CENTER.—At Trinity Center there is twelve feet of suow on the summit of the mountain, necessitating ahout six miles of snowshoeing to travelers. The Center and vicinity expect a boom. Besides the Strode and other properties that are paying well, new developments are heing made. The old Nash mine on Coffee creek, which has changed hands, has heen paying $10 per man to the force employed in drifting and prospecting, and it is the intention to put ahout 200 men at work in the near future. Wm. Volmers is ahout to build a mill on his location eight miles from the Center.

NEVADA.

Panaca District.

Lode: The recent sale of some mining property in Panaca district is directing attention that way. This district, until ahout a year ago, was known as Chief district, and considerahle miuing and prospecting was done there about twenty years ago. When it was an active little place silver was worth something, and the only mining done was for this metal. During the past few years only gold has heen sought after, hut this section was given very little attention, and while it was generally known that a sample could occasionally he found that would return a couple of ounces in gold, it was also supposed that only a sample could be found. But this state of affairs only proves that mining and prospecting may he well and thoroughly understood hy many and practiced only hy a few. The thorough investigation of the district and the Advance property in particular, made hy the recent investors (Messrs. H. W. Lawrence, P. Sheahan and Wm. Lloyd) has caused the attention that is heing given this section, and we understand that preparations are heing made for active work immediately.

Our hest information on the Advauce is that a shaft 105 feet in depth has a well-defined ledge from the surface to the hottom, with a two-foot streak of ore for the entire distance, giving $41 in gold and twelve ounces silver. Those who are hest acquainted with the district helieve it is a continuation on the north of the famous Ferguson district, ahout thirty miles distant.

The formatiou is principally quartzite. It is located eleven miles south of Bullionville, where W. S. Godbe's great reduction plant is situated. Everything appears favorahle and undouhtedly, with the early opening of spring, a lively camp will come into prominence in the district. We learn that many prospectors from Pioche and Panaca are already in the field, and many of the hoys "have greater bonanzas than can he found in Ferguson district."

ALASKA.

WINTER GRAVEL SLUICING.—*News:* Since the sluice mining commenced on Gold and Lemon creeks, for the past two months between $3000 and $4000 in gold dust has heen shipped through the Juneau bank and hy private parties. This winter more attention has heen paid to ground sluicing, as the mild weather has permitted the work, whereas during other wiuters the weather was too severe for its continuance. The gang of men at Lemon creek is doing mueh hetter than was expected hy the old-timers, who have previously examined the creek hottom.

IN SUM DUM BAY.—On her way up the Topeka called into Sum Dum hay and unloaded a stamp mill at the Bald Eagle mine, and also dropped off N. S. Trowbridge and P. Maul, the superintendent and foreman of the mine, and a gang of workmen. The plant will be sledded on the snow to a point ahout two miles back from the heach and near the mine, and its erection will go forward as fast as possihle. This spring another quartz mill will he crushing out the gold from Alaska ores.

ARIZONA.

The Montaua mill at Oro Blanco has begun operations again.

John J. Dodds and F. J. Lyon, of the Eugene Mining Company of Phœnix, are working their gold properties at Canon. This mining company is composed entirely of Prescott and Phœnix men.

THE RYLAND PROPERTY. — *Journal-Miner:* The Ryland mine and mill on Minnehaha Flat is daily in operation, and the fact of its being so is the hest argument that Mr. Ritchie is making a success of it. Heretofore under every management it has proven a failure. The reason for this can he easily proven. Theory may be all right on top of the ground; but when you go down into an Arizona mine, the only assistance you need is a little practical judgment.

THE VULTURE MINE.—The Phœnix *Review* learns that the Vulture mine will shortly he worked. New machinery will be put in, the pipe line repaired and the mine worked for all it is worth. This is gratifying news, for this mine, though long lying idle, is one of the best gold properties in Arizona. It has heen hadly managed; but under the new management this will he changed. Mr. Sydney Kempton will have charge of the mill.

This famous mine, according to the company's books, has produced $9,000,000 already. It will take some money, perhaps $150,000, to put the property in good running order, after which the mine will be just as hig a produeer as ever. Aside from the amount of gold taken from the Vulture mine as indicated hy the hooks of the company, an equal amount has been stolen by the men working the elaim. All the old-timers of Phœnix remember the good times when the Vulture was running. It will run again, and that in the near future.

BRITISH COLUMBIA.

PRODUCT OF A RUN IN THE CARIBOO MINE.—*Chronicle:* Three gold hricks, containing a small percentage of silver, and weighing 720 Troy ounces, or 60 pounds, and valued at nearly $10,000, were on exhihition at the Traders' bank yesterday. They were from the Carihoo mine, owned hy James Monaghan and other Spokanites, in the Rock Creek district, British Columhia.

The bricks are only worth $13.50 per ounce, owing to the presence of silver. They are the result of twenty-one days' run of the Carihoo Company's ten-stamp mill.

"The mine is going to make the owners all rich," said M. M. Cowley. "The company declared its first dividend to-day and it amouuted to $8000, after dedueting the cost of the mill and other improvements. Who brought the bricks down? Well, we don't care to say much about that. Nobody on the outside ever knows when the bricks are coming, what way they come, or who hrings them. Otherwise they might he intereepted on the way."

GENERAL NOTES.—The Antoine, Slocan, is a new shippiug mine, sending five cars forward this year. Three of those netted $8000.

Big strikes are reported on the Wonderful and Ivanhoe, Slocan. The rawhide trails are heing prepared for hauling.

On the Little Phil, Ainsworth, the ore does not occur in a solid vein, but in the shape of solid galena; a most unusual formation.

The Nelson Hydraulic Mining Company is getting ready to resume work at the earliest possihle date. Two monitors will he worked.

A number of husiness men of Nelson are offering $100,000 in land and money for the erection and operation of a smelter in that town.

The Center Star, which adjoins the Le Roi, Trail Creek, will he ready to ship ore shortly. Upwards of 500 feet of tunnel have heen pierced.

At sixty-seven feet in the Goodenough, Slocan, the vein, which carries ahout six inches of high-grade carhonates, was struck 120 feet from the surface. From this mine twenty-two tons netted $5435.12.

The Kootenay *Mail* gives ore shipments from Slocan hy way of Revelstoke, from Feb. 9th to 15th, as follows: Slocan Star, 370,000 lbs.; Nohle Five, 260,000 lhs.; Idaho, 120,000 lhs.; Reco, 70,000 lhs.; total, 1,820,000 lhs.

The Humphries-Moore concentrator at Three Forks has started running, chiefly on Alamo and Idaho ores, and all available teams are engaged hauling. Probahly Mountain Chief ore will he run through in the spring.

COLORADO.

A CREEDE CONSOLIDATION.—At Creode a consolidation has heen formed of the famous Ridge group of mines, Solomon, Ethel and Holy Moses. Large reduction works will be erected, and all the ore from these mines treated in one mill.

SALES OF MINING PROPERTY.—*Republican:* Four mining deals in Colorado properties were recently closed, so far as honding the properties, and are in a fair way to he quickly cousummated. Two of the sales were well known mines of Gilpiu county, one for a mine and mill in the Holy Cross distriet of Eagle county, and the other is a working proposition for the handling of a large group on the Spanish Peaks.

The Topeka mine, near Central City, was placed for the Argyll Mining Company with H. C. Woodworth & Son, investment bankers, for a price exceeding $300,000. It is one of the great gold produeers of the "Little Kingdom," and is known to hold in reserve great hodies of ore.

The New Centennial is being bought hy a Denver mining man who is always on the lookout for investments. The price is not known.

The Polar Star mine of Eagle county is being sold by F. D. Kiefer, of Grand Junction, to Denver parties for $175,000. With the property, which has produced largely in the past, is a 25-stamp mill, and the sale means a resumption of work to the full capacity of the mine.

IDAHO.

THE STANDARD MINE.—The Union mill has heen put in condition for service the past week for the treatment of ore from the Standard mine, which now employs fifty men. A new ore hin and other improvements have just been completed at the mouth of the main tuunel. The ore is of better grade than the average Cœur d'Alene ore. It is directly tributary to the town of Burke, hut Wallace receives the industrial henefit of the Union concentrator, which is situated at the mouth of Canyon creek. Messrs. Finch and Campbell are the principal owners of tho property. The Banner tuunel, which is the principal avenue into the mine, is over 2000 feet in length.

BOUND TO GET THE GOLD.—The Kootenai Hydraulic Company is hound to get some gold this year, after its many disappointing experiences along the Pend d'Oreille. Reports received from Seven Mile, via Waneta, state that the company has sixty men at work on the foundations for the hig pumps which are to take the place of the enormous diteh and flume originally designed to carry water on to the hars. By the time high water comes, the work will be well advaneed, and it is understood that the entire work is to he finished as soon as possihle. Heavy machinery has been ordered from the East, and before midsummer the managers hope to begin harvesting the gold which they know is seattered all through the big gravel banks.

Along the Salmon river times will be pretty hrisk next summer too. It will probahly he six weeks or more before the season fairly begids, hut already men who own claims are perfeeting their plans for the season's work. A new elemont will add activity to that district this summer—a class of men who don't happen to have cash enough to buy placer mines, but are willing to lahor, and have arranged with the owners to work the claims on shares—a plan which is of henefit to hoth parties, as few of the owners are exactly prepared to hire any large gangs of men to work their claims.

MONTANA.

THE RARUS DEAL. — *Inter-Mountain:* A United States patent to the Rarus mine, granted in 1894 to S. E. Hirbour et al., was filed for record lately with the county recorder. It is rumored that negotiations are ahout completed for the sale of this property for a sum variously estimated at from $300,000 to $400,000. The purchaser whose name is mentioned in connection with the deal is F. A. Heinze. The latter at one time had a lease on the property, and worked it for ahout a year. He had the mine bonded then for $350,000, and it was said made an offer of $250,000 for it, which was refused. It is known that Mr. Heinze has heen anxious to secure another good property in order to keep his smelter running to its full capacity, and mining men are of the opinion that the purchase of the Rarus would be a good investment.

TO WORK RICH PLACERS.—A new plan to handle flat placer ground has heen adopted hy the Gold Dredging Company, to handle the hed sand of Grasshopper creek in Beaver Head county. The company has paid in $75,000 to put on the plant, and start the work. Three and a half miles of creek bed and a large acreage of hars have heen secured. The ground is some of the hest known washings of Montana and has produeed mueh money in the past. The great difficulty in working it has always heen to find dumping ground, the fall of the creek not being sufficient to carry off

the tailings from the sluice. To remedy this the present managers purpose using a dredge to raise the sand, gravel and water into an elevated sluice that gives as much fall as may be wanted.

There is a sixty-five-mile ditch connected with the placers, which gives a 500-foot head at the end and furnishes a supply of 900 inches, with 250 pounds pressure for the operation of an injector to empty the working pit. After carrying off the water of the creek with a ditch along the side, the company first digs by hand a large pit, which is then washed by hedrock sluicing and shoveling the richer sand near it. While this is being done a portion of the pit dammed off is flooded with water and the floating dredge placed on it. Heavy cables stretched from bank to bank at an elevation support on pulleys a swinging sluice box, which is made to move either way as the dredge follows up the bar or moves across the creek. The sluice empties in the pit, which has been cleaned, and as the dredge progresses up the creek the working pit is emptied, the cleaned bedrock refilled and the intermediate pit is being shoveled and sluiced off by a force of workmen.

OREGON.

THE ASHLAND MINE.—*Tidings:* Upon application of the creditors, Judge Hanna at Jacksonville, this afternoon appointed Jos. Dame receiver of the Ashland mine, with bonds placed at $20,000. It is expected that work will go right ahead at the mine as soon as the papers are completed. The total claims represented in liens filed upon the property amount to nearly $8000, $4800 of which are wages due the miners and the remainder material claims held in Ashland.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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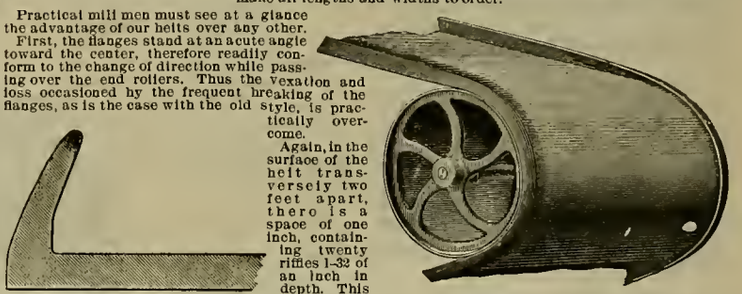

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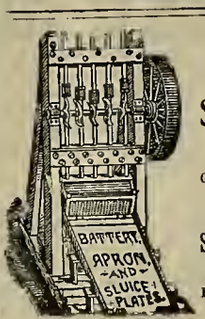

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Electrical Progress.

A PROJECT is under way to dam the Chatahoochee river near Atlanta, Ga., and to electrically transmit some 30,000 horse power therefrom to that city.

ORIGINAL contributions to this department of the paper, of general interest, will be welcomed. No anonymous communication will receive attention.

IN Norway, electrical treatment is being adopted in bleaching pulp. The pulp being placed in the chloride solution, the electric current is turned on, and the operation is completed in from twenty to forty minutes. — London Electricity.

ENGLISH patent number 856, dated January 14th, has been granted to Frederick J. Beaumont and Frederick Hallows of London for an improved registering meter for direct or alternating polyphase, triphase or quadruplephase currents.

AT Reno, Nevada, the Truckee river is wasting thousands of horse power of reliable water power which could be used to advantage at Virginia City, twenty miles distant. There is also a good opening for an electric road for both freight and passenger traffic between the two cities. Most of the freight is now transported by wagons.

HERMAN AERBERTS, of Scheuectady, N. Y., has produced an improvement in electrical measuring instruments, the principle upon which his instruments are based being to send the current to be measured in two electrically parallel branches of circuits round the needle or armature of the instrument, thus exciting in the latter two distinct polarites.

MR. L. W. STORROR, superintendent of the Pacific Postal Telegraph Company, in this city, is one of the ablest men in the business. He is business all through, and although burdened with greater responsibility than any other telegraph man on the coast, his attention is readily secured for the most trivial detail of the business. With such men at the lead any business is bound to succeed.

A NEW MODE OF LIGHTING has been introduced by Mr. Lester Betts, the manager of the Calcutta branch of the Oriental Telephone and Electrical Company, Limited, in the case of the Empress of India Cotton Mills at Budge-Budge, India, which are entirely lighted from the outside, special zinc fittings with fifty candle power lamps being fitted to each window. This system, which has proved a complete success, saves the extra premium for fire insurance.—Electrical Review.

THE Electrical Engineering Company of this city has the contract for the electrical plant for the three new pneumatic guns at the Presidio. There was heavy competition on this contract. The plant consists of a 35 K. W. generator, underground conduit to each gun, and a switchboard. The equipment for each gun consists of three electric motors, each of 18 H. P., and is used for loading and moving the huge gun. This firm has just shipped three direct electric elevator plants to Los Angeles for use in the Whittier Block. They report business steadily increasing in their line.

UNDER the heading of "A Worthy Task for Electrical Inventors," the *Electrical Review* publishes the following taken from the New York *Sun:* "Building water-tight compartment ships like the 'Elbe,' or much better than the 'Elbe,' won't prevent some of them from being sunk by collisions. If the 'Lucania,' for example—the last and finest from the shipbuilder's hands—should hit her sister, the 'Campania,' square amidships, the latter would be lost as surely as she would be hurt. The only safeguard for ships at sea is in the faithful use of some more penetrating sound than that of the fog horn, or the invention of some delicate electrical contrivance which shall always tell of another ship's presence in the neighborhood. Where are the wits of our ingenious brothers, the electricians?" Cannot some of our Pacific coast electricians solve this problem?

ACCORDING to *Nature*, trials have been made in London of a new apparatus for extracting teeth by electricity. It consists of an induction coil of extremely fine wire, having an interrupter capable of vibration at the rate of 450 times a second. The patient sits in the traditional armchair and takes the negative electrode in his left hand and the positive in his right. At this moment the operator turns on a current, of which the intensity is gradually increased till it has attained the utmost limit that the patient can support. The extractor is then put in circuit and fastened on the tooth, which, under the action of the vibration, is loosened at once. The operation is performed very quickly, and the patient feels no other sensation than the pricking produced in the hands and forearms by the current. [This was similarly reported ten years ago, but the difference between theory and practice was such as to exclude the operation from general use.]

A Huge Alternator.

A big alternator is now being built by the General Electric Company. It is to be installed for the Edison Electric Illuminating Company at St. Louis, Mo., and will supply current for incandescent and arc lighting and power, and is being constructed on the monocyclic system, employing low frequency of alternations, the armatures of the generators having special windings adapting them for use on circuits with self-starting current motors. The alternator is of 800 kilowatts capacity, has 80 poles, and will be driven at 90 revolutions per minute. The frame casting weighs 35 tons and measures 24 feet over all. The armature is iron-clad and is 16 feet in diameter, weighing nearly 45 tons. The armature will be supported on a 22-inch shaft. The generator will be able to supply, at full load, 667 amperes at 1200 volts, or the equivalent of 16,000 sixteen c. p. lamps.

Electric Power Transmission for Mines.

Probably no other application of transmission of electric power is more appreciated than in mining. In some instances the geological location of the mine renders a supply of fuel either entirely out of the question or very expensive; but the principal reason in favor of such application appears to be that in almost every instance ample water power—cheapest of all known sources of power—is within available distance from the mines, where, with a single source of power from one generator operated by a water wheel, transmission is readily and economically made not only to one, but to any desired number of locations in and about the mines, as is best suited to the requirements of the work to be performed.

A splendid illustration of such application is in operation at the Mammoth mine, situated in Nevada county, California. This plant is reported to have been run continuously day and night for the past year, stopping only for "cleanups," and without the expenditure of a cent for repairs or renewals, or the loss of a moment of time. Such a record would, of course, be an impossibility ordinarily; and in some cases, as, for instance, in the operation of mine pumps, it presents important features for consideration.

At the Mammoth mine the power station is located at the base of a ravine on the headwaters of the Fresno river, where a short ditch only was necessary to obtain a fall of sixty-three feet. From the end of the ditch the water is conducted to the wheel through a twenty-eight-inch pipe, 230 feet long. The power station consists of a three-nozzle, sixty-seven-inch Pelton water wheel running under a head of sixty-three feet at 109 revolutions per minute, and having a maximum capacity of 175-horse power.

The power is transmitted from the wheel to a countershaft by seventeen one and one-half-inch manilla ropes, giving the countershaft a speed of 300 revolutions, from which is driven by belt connection an Electrical Engineering Co.'s type C generator of 125-horse power. The current is carried to the mine, 8000 feet distant, by bare copper wires at a pressure of 1000 volts and supplies four separate and independent motors which operate a twenty-stamp mill and rock breaker, concentrator pump on central lift and a set of hoisting works. As the hoisting works require about fifty per cent of the power generated and are continually starting and stopping, throwing the current on and off instantly, regulation at such high pressure and under such great variations of load proved one of the most trying propositions encountered. This, however, has been successfully accomplished by use of the Pelton differential governor on the water wheel, which, it is said, maintains a uniform voltage under any and all of the variations incident to the operation of such a variety of machinery in an intermittent and irregular way. On account of the peculiar local conditions, this plant has attracted no small amount of attention from capitalists and from scientists, and its complete success has demonstrated that a comparatively large amount of power can be procured by this means, and run at a merely nominal cost as compared to steam, and without the inevitable delays incident to steam-power systems.

It is predicted that the day is not far distant when every large mine in the country will have adopted electric power, and that such adoption, in view of superior advantages for continuous service, as shown in the record of the Mammoth mine outfit, will result in the more general use of convenient water power.

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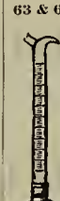

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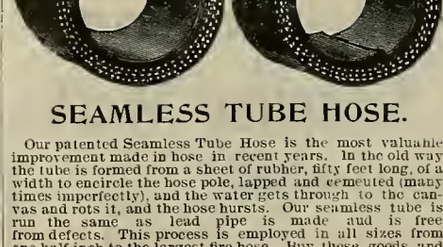

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Tremendous Pressure.

A wonderful machine, which is not only a prodigious and terrible piece of enginery, but an allegory, is called a testing machine, and is used to ascertain the resisting power of various materials. It is not content with finding out that a beam of oak, for instance, will bear without breaking a pressure on one spot of 160,000 pounds; the beam must be utterly crushed each time the test is made, and note must be taken of the exact weight that lay upon it at the moment of its final dissolution. Day after day this great machine heaves and strains itself and bears down with slow and awful force upon some tough beam or block of wood; and whether the timber is placed flatwise and needs, say, but a paltry seventy-five tons to crush it, or whether it be placed endwise like a pillar, and will hold up twice as much weight before it cries out and gives up the ghost, it must yield just the same and surrender its pitiful crushed frame to be photographed and studied and picked to pieces for the benefit of science. That is the machinery; the allegory lies in the thing by the force of which this monstrous pressure is exerted. It is oil, nothing but suave, gentle yielding oil, the emblem of softness and agreeableness.

There is a certain piston in this mechanism which, pressing against a quantity of oil in a confined space, forces this oil against another iron surface, which in turn presses forward upon the timber, so that all this crushing power is exerted by the medium of nothing but oil. It is the oil that does it. The foreman stands over his great machine, his pupils grouped about. It lies down flat on its great back, like a giant bracing his shoulders against a rock to push with his feet. The thing which he is pushing against is a beam of seasoned oak, about ten inches square, and the thing with which he is pushing is another and lengthwise square beam of oak, the end of which is directly against the side of the beam to be crushed. Off at one side, apparently unconnected with the machine, but in reality connecting with it, is an apparatus where there are levers, comparable to the throttle valve of a locomotive, and a gauge which registers accurately the pressure that is being exerted. A young learner stands at these levers and this gauge, and when the foreman says, "Turn on more oil," he moves a lever and the pressure rises. Seventy thousand pounds, 80,000 pounds, it rises rapidly. The lengthwise beam is sinking itself deep into the side of the victim timber, but this still holds out bravely. The pressure rises to 90,000—100,000 pounds. The watchers all gather around the center of the pressure in anticipation of the catastrophe; the lengthwise timber is squeezing into the solid oak of the other one as one's thumb might be driven into a piece of cheese.

But still it holds. Little by little the power is turned on. The young man at the gauge calls "120,000," "130,000," "140,000," "150,000;" you hear the snapping of a myriad of tendons within the beam, and all these sounds join in a sort of low buzzing roar or cry, which suggest an elemental agony. One hundred and sixty thousand pounds—the beam sinks deeper into the flesh of its victim—170,000—"More oil!" and now the crackle rises—the lengthwise beam itself begins to crack, and the other beam, yielding at last, goes to pieces all at once: and when the pressure is removed it is taken out, twisted, contorted, riven, pierced, crushed.

It is useful service, after all, though it seems but an exhibition of the brutality of mere mechanism, that the testing machine and its bed of oil have done; for since it began the work it has proved that timbers will staud about one half the weight which the accepted authorities said they would stand; and by introducing a more conservative weighting of wood has doubtless saved many human lives from destruction by the collapse of timbered structures.

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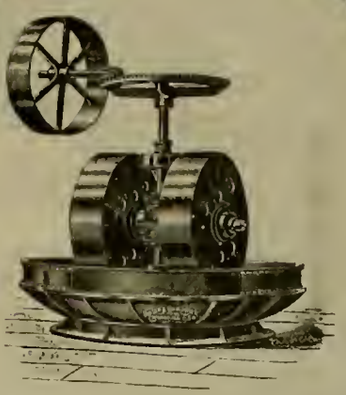

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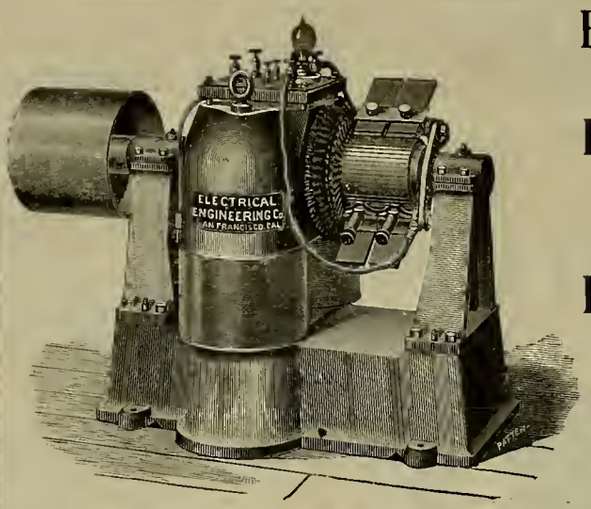

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Hot Salt Solution for Relief of Short Hemorrhage.

Dr. Wyeth, speaking at the meeting of the New York State Association of Railway Surgeons, strongly recommended the injection into the circulation, through a vein, of hot salt solution to take the place, in part, of the volume of blood which has been lost as a result of accident. "The solution which I have employed, running in as much as five points in a single operation, is composed of clean water, which has been boiled and allowed to cool to 110° or 120° F., or just as hot as the hand can bear, to every pint of which a teaspoonful of common salt is added. I have seen the pulse go from 140, in cases of tremendous hemorrhage, steadily down to 70 to the minute within two minutes of the injection of a pint of this solution. While it may be used cooler than 110° F., and in some emergencies this may be necessary, it is safer to give it as hot as 110° to 120°, because the cold solution robs the body of its heat, while the hot solution carries heat with it, and thus adds to the maintenance of the normal temperature. The apparatus is simple, a metal or glass pipette to go into the vein, a rubber tube three or four feet long and an irrigator bag or vessel."

THE Boxer, the latest torpedo boat built for the British Admiralty, is 201½ feet long, 19 feet beam; draught, loaded, 7 feet 2 inches. On a recent trial trip the mean speed on six runs over the measured mile was 29.314 knots, or 33¾ statute miles, per hour.

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PATENT SOLICITORS.
ESTABLISHED 1863
Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us enables us to give advice which will save inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 220 Market St., S.F.

Market Reports.

The Markets.

SAN FRANCISCO, Feb. 28, 1895.

Silver appreciated a trifle during the week. It is believed that it will not again go below the 60 mark. The story is again told, with considerable semblance of truth, that the reason British capitalists are now inspecting and securing promising silver properties in the northwest is the prevalent British belief that favorable British legislation toward the white metal is one of the assured events of the near future, and that inside of a year the British parliament will tacitly recognize every claim put forward by the friends of silver or the political economists who recognize the necessity of a bimetallic policy.

In 1864 the price of bar copper in New York City was 55 cents per pound. Despite the enormous consumption of copper occasioned by the great advance in electrical equipment, copper is quoted to-day at 9¾ cents, with a downward tendency. In the same year galena sold for $225 per ton and lead for 25 cents per pound: to-day it is slow of sale, in New York, at 3¼.

New York Metal Market.

NEW YORK, Feb. 28.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.
COPPER—Brokers', 9¾@c; exchange, 9.90c.
LEAD—Brokers', $3.02½; exchange, $3.10.
TIN—Straits, 13¾c; plates, ——c.
SPELTER—Domestic, $3.20.

New York Prices.

NEW YORK, Feb. 28.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	27½	60	9 75	3 02½
Saturday	27¼	60	9 75	3 02½
Monday	27⅛	60¼	.....	.....
Tuesday	27¼	60⅜	.....	.....
Wednesday	27⅜	60⅜	9 75	3 02
Thursday	27⅜	60½	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½c
New York Telegraphic Transfer	7½c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.89½
Refined Silver, per ounce	60½
Mexican Dollars, nominal	49@49½

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Rsfined, in car lots	—	@	5½
Powdsred, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sbsathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	6 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
NAILS.			
Wire			$2 90
Cut			2 65
PIG TIN.			
Per lb	15	@	16 00
ZINC.			
Sheet	8¼@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 75
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			12 50
Wallsend			7 00
Scotch Splint			8 00
Wymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	11 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'			75c ℔ bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, Feb. 28, 1895.

Last week the little bears had things their own way. This week there was an upward tendency, prices holding strong through the week, particularly on the north end stocks.

The Con. Cal. & Va.'s bullion output for February was $51,081.84, on which there was a $10,000 profit for the company. Supt. Lyman gives very good reports of the mine during the week. General reports from the Comstock are favorable.

The following mining companies have been dropped from the list of the San Francisco Stock Exchange for non-payment of the annual dues: Baltimore, Grand Prize, Navajo, Belle Isle, Commonwealth and Mayflower.

The auction sale of the delinquent stock of the Yellow Jacket mine was held by Sheriff Quirk at the office of the company in Gold Hill Wednesday afternoon, says the Virginia *Enterprise*. Out of the capital stock of the company only 376 shares were delinquent, the assessment of twenty-five cents per share having been collected on the balance. The highest bidder was H. S. Beck, who bought the forfeited stock at 37½ cents per share.

The new commission rates adopted by the Denver Exchange go into effect this week. On stocks selling at 2 cents and under the broker is allowed ⅛ cent a share; from 2 to 10, ¼ cent; from 10 to 25, ⅓ cent; from 25 to 50, 1 cent; from 50 to 75, 1½ cents; from 75 to $1, 2 cents; from $1 to $2, 2½ cents, and above $2, 1 per cent on the money handled—a little difference from the Pine street tariff.

The following illustrates the changes of the week:

Mines.	21	28
Alpha	$ 07	.....
Alta Consolidated	31	$ 33
Andes	23	26
Belcher	40	46
Best & Belcher	77	77
Bodie	88	82
Bullion	08	.....
Challenge	.....	40
Chollar	50	54
Confidence	.....	1 35
Consolidated California and Virginia	2 55	2 55
Consolidated New York	.....	.....
Crown Point	42	47
Exchequer	.....	.....
Gould & Curry	44	49
Hals & Norcross	90	98
Justice	.....	.....
Mexican	74	74
Ophir	1 45	1 55
Overman	.....	15
Potosi	.....	50
Savage	41	44
Sierra Nevada	60	61
Union	42	44
Utah	.....	06
Yellow Jacket	42	59

San Francisco Stock Board Sales.

SAN FRANCISCO, Feb. 28, 1895.

9:30 A. M. SESSION.

150 Andes	24	500 Kentuck	04
100 Belcher	42	200 Mexican	74
500	44	1000 Occidental	06
150 Best & Belcher	77	500 Ophir	1 50
50	76	100 Potosi	49
100 Bonanza	05	200 Savage	42
100 Chollar	51	100 Sierra Nevada	61
450 Con Cal & Va	2 50	50 Union	44
500 Crown Point	42	700 Utah	06
150 Gould & Curry	45	100 Yellow Jacket	53
300 Hale & Norcross	95		

SECONN SESSION—2: 30 P. M.

200 Alta	33	600 Crown Point	47
50 Andes	26	100 G. & C.	49
200 Belcher	46	200 H & N	98
100 Bodie	82	700 Ophir	1 55
100	81	100 Overman	15
450 Chollar	53	350	16
450	54	350 Potosi	50
300 Challenge	40	50 Savage	44
300 C. C. V	2 55	600 Yellow Jacket	59
100 Confidence	1 35		

SUCCESSIVE strikes of miners in Eugland and Scotland are said to be rapidly developing the coal production of India.

THE Kougo railroad has cost $62,000 per mile, which is just double the estimate.

ABOUT five-eighths of the steamers in the world are under the British flag.

A SHORT TIME AGO the mill of Smith Bros. & Co., at Portland, Or., made the largest cut ever made at the mill, running on spruce stuff. Simonds' "B" pattern saws were used. The foreman, Mr. Flood, believes the Simonds saws have no equal.—West Coast Lumberman.

J. Henry Searles,
Formerly of New Hampshire,
Please write to the undersigned.
FIVE DOLLARS REWARD
For first information of his present residence.
Address
A. A. HIBBARD, 602 Market Street, San Francisco.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied,	Delinq't and Sale.	Secretary.
Booth G M Co, Cal	5	2c	Feb 18,	Mar 25, Apr 17	Geo R Spinney, 310 Pine
Bullion M Co, Nev	44	10c	Jan 21,	Feb 26, Mar 21	R R Grayson, 331 Pine
Bullion Con G M Co, Cal	1	10c	Feb 19,	Mar 25, Apr 25	C A Grow, Mills Building
Challenge Con, Nev	18	5c	Feb 19,	Mar 26, Apr 16	C L McCoy, Mills Building
Confidence S M Co, Nev	25	30c	Jan 9,	Feb 13, Mar 6	A S Groth, 414 California
Con New York, Nev	13	5c	Feb 19,	Mar 26, Apr 17	Chas E Elliott, 309 Montgomery
Crescent M Co, Cal	1	10c	Jan 15,	Feb 16, Mar 11	A K Durbrow, 309 Montgomery
Eureka Con, Nev	13	25c	Feb 19,	Mar 25, Apr 11	H P Bush, 134 Market
Golden Eagle M Co, Nev	1	15c	Jan 8,	Feb 28, Mar 4	E B Holmes, 309 Montgomery
Gould & Curry S M Co, Nev	75	15c	Jan 17,	Feb 19, Mar 12	A K Durbrow, 309 Montgomery
Granits G M Co, Cal	2	1½c	Jan 2,	Mar 9, Apr 6	Wm Schaw
Inyo Marble Co, Cal	26	10c	Jan 21,	Mar 6, April 5	W W Sargeant, Mills Building
Julia Con M Co, Nev	26	5c	Feb 13,	Mar 20, Apr 10	J Stadtfeld, Jr., 309 Montgomery
Justice M Co, Nev	58	10c	Feb 9,	Mar 14, Apr 3	R E Kelly, 309 Mootgomery
North San Juan G M Co	1	12c	Jan 28,	Mar 8, Mar 27	H W Morris, 143 First
Reed M & M Co, Nev	1	2c	Dec 31,	Feb 11, April 3	John H Isham, room 33, Mills Bldg.
Sierra Nevada S M Co, Nev	108	25c	Jan 16,	Feb 20, Mar 11	E L Parker, 309 Montgomery
South Eurska M Co, Cal	17	1c	Feb 20,	Apr 1, Apr 22	A Halsey, 328 Montgomery
Standard Gravel Co, Cal	1	12c	Jan 25,	Mar 4, Mar 22	W H Schmidt, 207 East
Starlight Mining Co, Cal	5	10c	Feb 11,	Mar 18, Apr 8	H R Williar, 214 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Bullion Con G M Co	C A Grow, Mills Building	March 9
Hale & Norcross, Nev	A B Thompson, 26 Nevada Block	March 13
Potosi M Co, Nev	C E Elliott, 309 Montgomery	March 13

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING FEBRUARY 19, 1895.

534,593.—CHECKING DEVICE—J. Arnott Jr., Camptonville, Cal.
534,465.—LEATHER LOOP MACHINE—F. J. Bringham, S. F.
534,249.—THRESHER—T. A. Bryerley, Stockton, Cal.
534,549.—AIR COOLER—J. R. Cook, Pioche, Nev.
534,363.—FLY SCREEN—Deacon & Lotspeich, Los Angeles, Cal.
534,471.—CULTIVATOR—R. Franken, Los Angeles, Cal.
534,507.—RON COUPLING—E. M. Hoagland, Saliua, Cal.
534,331.—BOLT—J. Hodgson, S. F.
534,564.—GAS PIPE—D. J. Macpherson, Pasadena, Cal.
534,443.—BLACKING CASE—L. Mauguin, Cottage Grove, Ogn
534,278.—SACK HOLDER—I. G. Moon, John Day, Ogn.
534,516.—MAGAZINE GUN—B. F. Pettit, San Luis Obispo, Cal.
534,374.—DENTAL TOOL—O. H. & A. F. Piper, San Jose, Cal.
534,519.—ELECTRIC RAILWAY—A. Rosenholz, S. F.
534,527.—RIVETING MACHINE—J. I. Smith, Chico, Cal.
534,452.—KEY RING—J. C. Schlarbaum, S. F.
534,285.—VEHICLE SEAT—T. C. Shankland, Oakland, Cal.
534,591.—LUBRICATOR—Wible & Pressey, Arcata, Cal.
534,309.—COLLAR BUTTON—G. H. Williams, Los Angeles, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CONDUIT ELECTRIC RAILWAY.—Alfred Rosenholz, San Francisco, Cal., assignor of one-half to Samuel J. Clarke and Harvey S. Brown. No. 533,610. Dated Feb. 5, 1895. This invention relates to improvements in conduit electric railways. It consists of a slotted tube or tunnel; a main conductor or conductors extending parallel therewith and having branch wires leading from the main conductors into the tube or tunnel; tilting arms with which these wires connect, the arms acting as switches to turn on or cut off the current. A conducting wire is stretched between automatically adjustable arms which project through the slot into the tube or tunnel from opposite ends of each car. This wire forms contact with rollers over which it passes at each of these switches, and when this contact is formed, a current of electricity will pass through the wire to the motor mechanism on the car. As soon as the car has passed the switch, the latter instantly cuts off the current, while the car forms contact with the next successive switch, and so on from one end to the other, a new supply of electricity passing in at each successive contact. The main conductors passing through a sealed and insulated-containing tube, all leakage and loss of electricity is thus prevented.

HOISTING AND CONVEYING APPARATUS.—Louis Rosenfeld, New York, N. Y. No. 533,669. Dated Feb. 5, 1895. The object of this apparatus is to effect the forward and back travel of the load while being suspended at any height without the use of latches, and to enable the load to be raised or lowered at any point. The apparatus consists of a sheave carrier, by which is meant a frame containing a pair of sheaves; means whereby the sheave carrier is caused to travel forward and backward, a load rope, the ends of which are guided to the load by the sheaves of the carrier, and whose hight passes freely through a running block, and a hoisting line connected with the runuing block.

FOR SALE.

The Whole or Half Interest in a good quartz mine (last assay $70.34 per ton). Three immense ledges of 4000 feet long, 600 feet wide, crosscut showing thirty feet of quartz; plenty water and timber on the ground; only three miles from melting works; good reason for selling. Selling price, $30,000 for whole mine. Address
E. R., 1405 Bush St., San Francisco, Cal.

Assessment Notices.

FAIRFAX VILLA COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 19th day of February, 1895, an assessment, No. 2, of one hundred dollars ($100) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of March, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 16th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. STADTFELD, Jr., Secretary.

Office—Room No. 56, No 309 Montgomery street, San Francisco, California.

CHALLENGE CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the nineteenth (19th) day of February, 1895, an assessment (No. 18) of Five Cents (5c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 35, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-sixth (26th) day of March, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on TUESDAY, the sixteenth (16th) day of April, 1895, to pay the delinquent assessment, together with cost of advertising and expenses of sale.

By order of the Board of Directors.

C. L. McCOY, Secretary.

Office—Room 35, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

BOOTH GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Auburn, Placer county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the eighteenth day of February, 1895, an assessment (No. 5) of Two (2c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, No. 310 Pine street, Room No. 28, San Francisco, Cal.

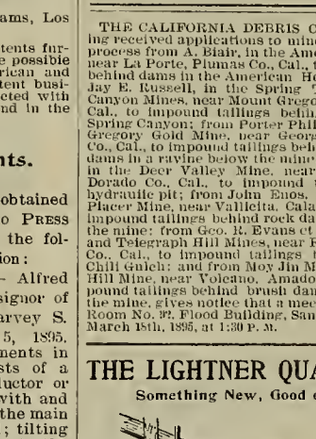
Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on WEDNESDAY, the seventeenth day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. R. SPINNEY, Secretary.

Office—No. 310 Pine street, Room No. 28, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from A. Blair, in the American House Mine, near La Porte, Plumas Co., Cal., to impound tailings behind dams in the American House Ravine; from Jay E. Russell, in the Spring Tunnel and Spring Canyon Mines, near Mount Gregory, El Dorado Co., Cal., to impound tailings behind brush dams in Spring Canyon; from Porter Phillips, in the Mount Gregory Gold Mine, near Georgetown, El Dorado Co., Cal., to impound tailings behind brush and log dams in a ravine below the mine; from Wulff Bros., in the Deer Valley Mine, near Green Valley, El Dorado Co., Cal., to impound tailings in an old hydraulic pit; from John Enos, in the Strawberry Placer Mine, near Vallicita, Calaveras Co., Cal., to impound tailings behind rock dam in a gulch below the mine; from Geo. R. Evans et al., in the Red Hill and Telegraph Hill Mines, near Ranchería, Amador Co., Cal., to impound tailings behind log dam in Chili Gulch; and from Moy Jin Mun, in the Grizzly Hill Mine, near Volcano, Amador Co., Cal., to impound tailings behind brush dam in a ravine below the mine, gives notice that a meeting will be held at Room No. 22, Flood Building, San Francisco, Cal., on March 18th, 1895, at 1:30 P. M.

THE LIGHTNER QUARTZ MILL.
Something New, Good and Cheap.



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—MANUFACTURERS OF—
STEAM ENGINES, BOILERS,
And all kinds of
✦ ✦ MACHINERY FOR MINING PURPOSES.
Flour Mills, Saw Mills and Quartz Mills; Machinery Constructed, Fitted Up and Repaired.
FRONT STREET, Bet. N & O.,
SACRAMENTO, CAL.

BACK FILES of the MINING AND SCIENTIFIC PRESS (unbound) can be had for $3 per volume of six months. Per year (two volumes), $5. Inserted in Dewey's patent binder, 50 cents additional per volume.

Coast Industrial Notes.

—The advent of pennies is reported in Seattle, Wash.

—The Great Northern in Washington State has contracted for 350,000 ties to be delivered by June 1st.

—The revenue steamer Rush is to have an electric light plant. Bids close at the Custom House next Monday.

—During 1894 the Arizona Company at Flagstaff, Arizona, shipped 148 carloads of pine lumber to Los Angeles.

—Lumber exports from the Puget sound district in the month of January amounted to 4,971,000 feet, valued at $41,105.

—Centralia, Wash., has voted in favor of issuing bonds to purchase an electric light plant for $13,000, the bonds to run twenty years.

—The Coast and Geodetic Survey steamer Hassler, now at Tacoma, is ordered sold. She was built twenty-five years ago, and cost $70,000.

—The Sunset Telephone Co., has about completed arrangements to connect this city, Stockton, Sonora, Angels, San Andreas and intermediate places.

A carload of eggs laid on the Pacific Coast was sold to a Chicago dealer this week. This is the first time California eggs were ever sold east of the Missouri river.

There are said to be nearly 100 steam vessels in Alaskan waters that are never inspected, says Supervising Inspector Birmingham. It is practically impossible to do so, by reason of inaccessibility.

—The owners of the steamer Alice Blanchard, are negotiating for the purchase of a large steamer which is to be put on the route between Alaska and San Francisco, calling in at Portland, Coos Bay and Eureka.

—The Market Street Railway Co. are pushing their electric railway schemes, and propose displacing the cable system on Market street by electric cars. They are also building two electric roads from First avenue to the ocean.

—It is seriously announced that the Great Northern Railway is preparing as rapidly as possible to extend its coast line from Seattle south to Tacoma and Portland, and at the latter city it is to connect with the Southern Pacific for this city.

—Sixteen more miles of track will complete the line of the Santa Fe, Prescott & Phœnix Railway Company. It will be in operation in three weeks. The new road is 197 miles in length, extending from Ash Fork, via Prescott, to Phœnix, Arizona.

—The Pacific Coast Steamship Company has reduced freight rates between this port and Alaska from $11 to $3 per ton on general merchandise, subject to a further reduction to parties having freight contracts with the company, being the result of competition.

—President Palmer, of the Golden State and Miners' Iron Works, has finished the 300-H. P. engine, previously reported, which goes to the Casper Lumber Co., of Mendocino. The Works has also turned out a tandem compound engine for a stern-wheel steamer in Alaskan waters.

—The Felts Electric Light and Power Co. has incorporated. Principal place of business, Colusa. Capital stock, $1,000,000, with W. W. Felts, E. F. Pearl, G. T. Scott, J. K. Bartholomew, C. C. Felts, C. B. Harden, E. E. Scott, W. F. Ford, and U. W. Brown as directors.

—The Sacramento Electric Light and Power Co. have begun the erection of their pole line between Folsom and Sacramento. The first of the 1000-H. P. electric generators will be at the power house in Folsom about May 15th. The company expects to have the power in Sacramento and available for use by June 5th.

—The articles of incorporation of the San Francisco and San Joaquin Valley Railroad were filed this week. They provide for the construction of a railroad from a point on San Francisco Bay to Bakersfield, the distance being, approximately, 350 miles. The capital stock is set at $6,000,000, and $1,746,500, representing ten per cent of 17,465 shares, has already been subscribed.

—The first cargo of wheat that has gone around Cape Horn in thirty years, or since the transcontinental railroads monopolized the trade, has arrived in New York on the ship Reaper. It consists of 2000 tons, from Astoria, Or. The wheat will be sold at a loss, but the trip is due to the fact that the Reaper's cargo of barley was destroyed in the Portland fire of September '94, and the vessel had to take wheat instead.

The Union Gas Engine Co. has just shipped to the Margaritte Mining and Milling Co. a new form of sinking pump and gas engine combined. It is all self-contained and will be used in sinking a new 250-foot shaft on the mine.

—Grace & Co's chartered steamer the Bawumore is back form Talara Bay with 2500 tons crude oil. Captain Woodside reports having used liquid fuel all the way up, and found it satisfactory. The flues were clean, and there was no ash. The return trip was made in twenty days.

—On the Mexican International railway construction has commenced on the branch from Monclova west to the mining town of Sierra Mojada, about 160 miles. The line was partially graded in 1892. Work has also been commenced on the branch from Riata southeast to Monterey, sixty miles.

—The West Side Canal and Land Company has incorporated with a capital of $5,000,000, of which $25,000 have been subscribed. The purpose of the company is to irrigate Fresno, Kings, Merced and Stanislaus counties. Directors—William Strader, B. W. Gray, T. L. Orr, A. B. Dobbins and Wm. J. Smith.

—The Ontario Electric Company has incorporated with a capital stock of $100,000, of which $95,000 has been actually subscribed. Work will shortly be commenced on the Euclid-avenue electric railway, which will be seven miles long. Electric lights and a tower are also to be furnished by the new company.

—A syndicate of wealthy Chinese of this city, composed of members of the Six Companies, has secured a lease of the fruit ranch owned by General John Bidwell, the Chico millionaire. Bidwell's orchard was for many years the most extensive in the State, and still ranks second, containing between 4,000 and 5,000 acres planted in deciduous fruits.

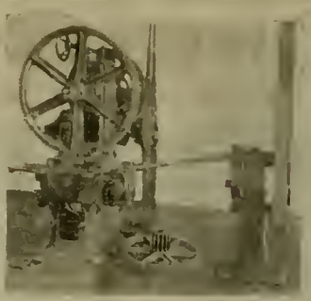
—Governor Budd has appointed the following to act as commissioners for California at the Mexican International Exposition next year: Colonel A. Andrews, Irving Scott and James Cross of this city, Colonel H. Weinstock of Sacramento, S. J. Del Valle of Los Angeles, and Daniel Murphy Jr. of San Jose. These commissioners will act in conjunction with the local Mexican Consul.

—The bill which was introduced in the State Senate providing for the formation of a Sacramento Valley Drainage District, has been withdrawn, Senator Hart explains that he had introduced the bill as the request of Hon. A. H. Rose, Commissioner of Public Works, but had not agreed to support it. While he believed some plan of reclamation similar to that proposed by Mr. Rose would be adopted at a future time, he did not think the people were ready for it yet.

—The San Francisco and San Joaquin Coal Company has incorporated to purchase and deal in lands containing coal and coal deposits in the counties of Alemada and San Joaquin and elsewhere, to buy and build wharves, warehouses, etc.; manufacture lime; bore for natural gas and oil; to build, open and conduct hotels, stores; to manufacture machinery, and for various other business purposes. The directors are James Treadwell, John W. Coleman, J. D. Fry, J. C. Johnson, R. D. Fry and H. A. Williams. The capital stock is $5,000,000, of which $6,000 has been subscribed.

—Eight establishments submitted bids for the construction of the three torpedo boats authorized by Congress. The bid of the Union Iron Works was: department plan, one boat, $135,000; two boats, $129,000 each; three boats, $120,000 each; total, $360,000. Modified plan: one boat, $125,000; two boats, $120,000 each; three boats, $116,000 each; total, $348,000. Modified plan, larger boat, 240 tons displacement, and twenty-eight knots speed: one boat, $243,000. The Fulton Engineering and Shipbuilding Works bid: department plan, one boat, $148,000; two boats, $145,000 each. The boats must have a speed of 24.5 knots; there is no premium for extra speed, but there is a penalty of $10,000 per knot for failure to reach the requirement. "The department plan" is on plans furnished by the government: the "modified plan" is on plans submitted individually by the several bidders. It will be probably April 10th before it can be determined which is the bid to be accepted.

THE Mount Bischoff mine, in Tasmania, has paid over $6,000,000 in dividends.



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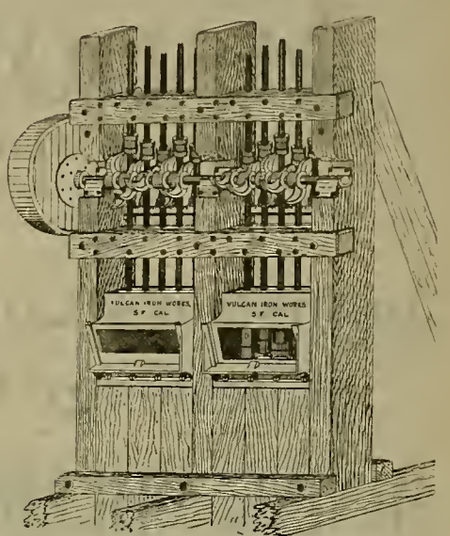

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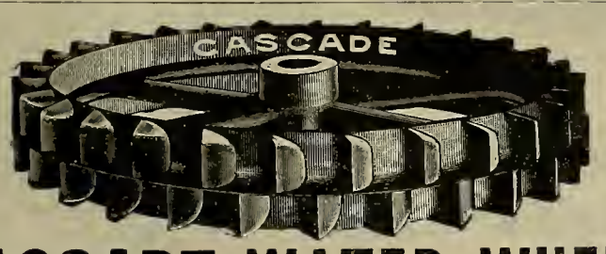

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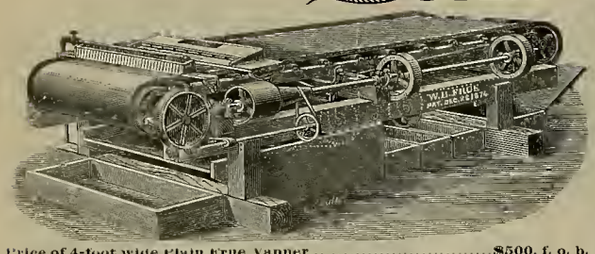

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—o—

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AGENT FOR THE
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" " "	Improved Belt Frue Vanner	600, f. o. b.
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GLADSTONE MINING COMPANY, FRENCH GULCH, Shasta Co., Cal.
C. J. Clark, M. E., Gen'l, Supt. Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill.
C. J. CLARK, Gen'l Supt.

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The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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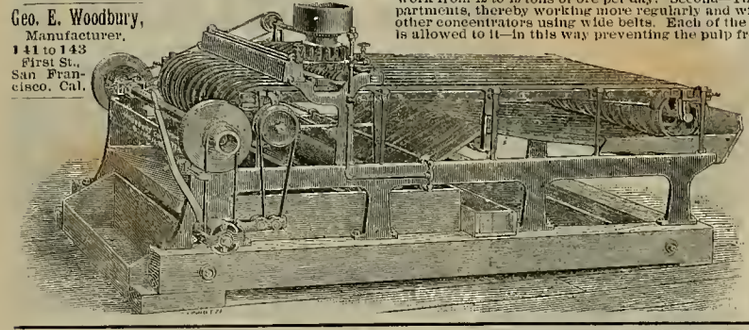

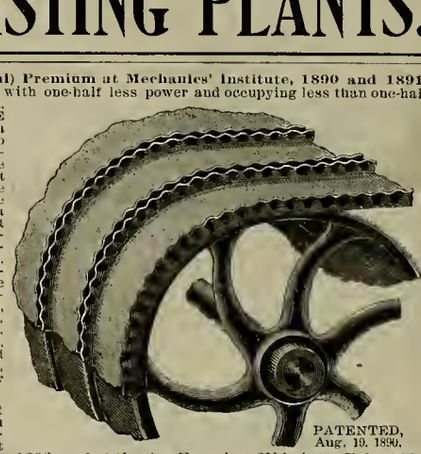

PATENTED, Aug. 19, 1890.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1894

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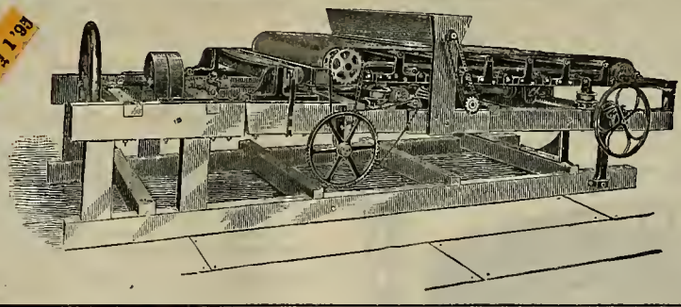

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THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94¾ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily ecommend it to the mining public. Yours respectfully,
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VOLUME LXX. Number 10.

SAN FRANCISCO, SATURDAY, MARCH 9, 1895.

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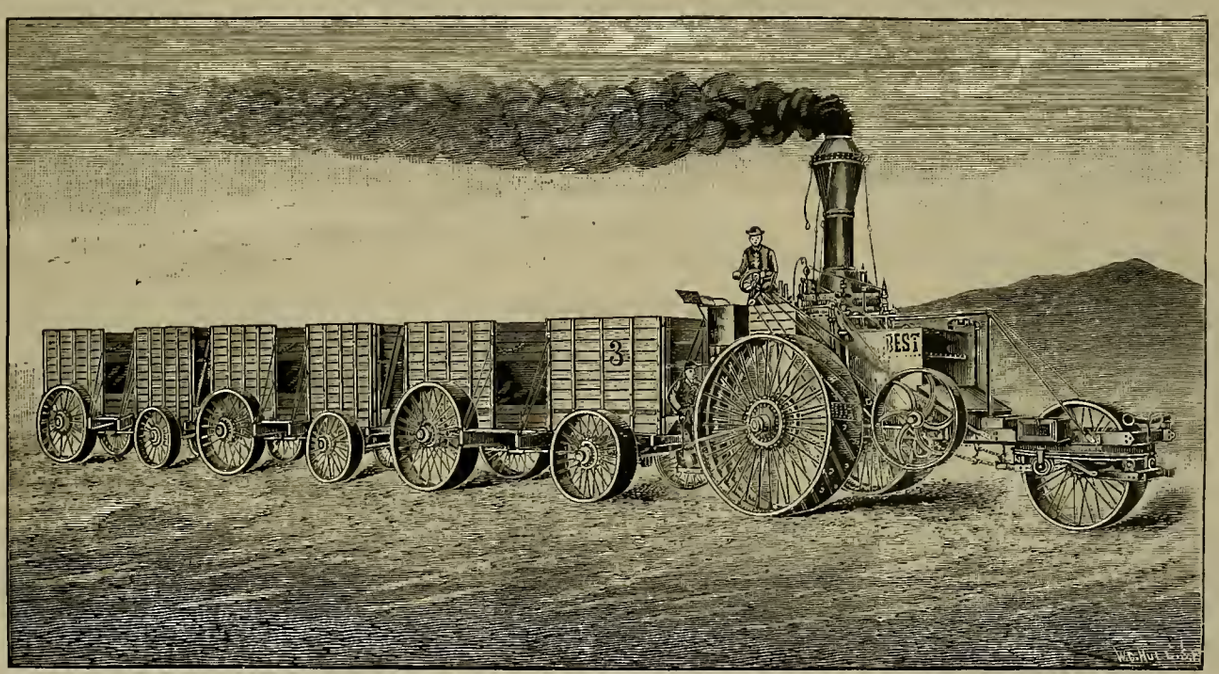
Traction Engine and Train for Steam Freighting.

At no work does a high-power traction engine show to better advantage than in steam freighting, which is now so extensively and profitably used in this State.

With suitable wagons, a reasonably good road, and with water and fuel stations properly located, the cost of moving grain, logs, lumber, coal, ore, etc., by the use of these wagons is not more than one-third as much as by the use of animal power.

The engine, as shown herewith, is of fifty-horse power, built by Daniel Best, of San Leandro, especially for steam freighting over any ordinarily good road. It can ascend and descend grades, as is practically done with horse or mule teams when in hauling freight.



TRACTION ENGINE AND WAGONS FOR HAULING FREIGHT.

These engines are capable of hauling twenty-five to forty tons, exclusive of weight of train, over grades of as much as 500 feet to the mile, and, in a pinch, much steeper grades; and on comparatively level roads the load may be increased fifteen tons or more.

This train is now in use in hauling salt a distance of thirty miles over the desert in San Bernardino county in this State, from the mines of the "Crystal Salt Co." to Danby, a point on the Atlantic and Pacific railroad, to be shipped to different points. This route is somewhat sandy; the train, however, makes the round trip (sixty miles) in one day and a half, including loading and unloading. The cargo averages about forty tons at each load.

That is a very trying place to operate a train, owing to the loose sand to be contended with and the scarcity of water for the engine—the water being hauled in sufficient quantity from one end of the road by the engine to supply it for the round trip.

However, the train is a success there and makes it possible to market one of the great resources of this State that otherwise would lie dormant for want of way of getting it to a shipping point on the railroad.

These engines are also extensively used in this State for hauliug logs to the mills and lumber to the market, some large firms owuing as many as three and four each, and at a profit considerably over animals which were formerly used by them, the engines doing the work much more satisfactorily.

As in the case of cable and electric roads and bicycles, it would seem that the raising of horses as beasts of burden is to dwindle as fast as the whale fisheries. Such machines as those herewith depicted will revolutionize land carriage. One Mendocino firm write that they have but two horses where two years ago they had 150. The lumber men "run up grades of 800 feet to the mile in going after logs. When they get to the point where they can go no farther without inconvenience, a horseman carries a light cable through the woods for a quarter of a mile if necessary and attaches it to a tree; then the engine on the wagon is set to work. It having a heavy cable and reel, it draws in the small cable, and in doing so the heavy one is paid out, and by the horseman attached to a log. Then the engine is set to work again and winds up the cable on the reel, and in doing so brings the log along with it. Then the engine is set to work again and loads the logs on the trucks, and so they build up fifty-ton loads and deliver them at the mill. They cut down no brush because they run over it. If a stump is in the way they simply take hold and pull it up and drag it out of the road."

In the great wheat fields of the State the traction engine finds as useful a place. By their use grain is cut and thrashed, aud sixty acres can be plowed in twenty-four hours. They will pump water, clear land, make roads, and will come in of use around a mine. "Say a railroad passes within thirty miles of a great mine. The traction wagon can go to the mine, making its own road, and can haul in at one time sixty tons of ore, aud all the expense is the little coal it burns and the labor of two men. It would bring sixty tons of ore thirty miles in seven hours. It could go to the mine, load the ore and bring it back between sun and sun, and, if necessary, could return and do the same thing over in the night, because it is not like an animal; it does not get tired; it is not particular about its food; all it wants is a little carbon in the shape of soft coal.". West Australian gold miners who depend on camels for freight are taking up this matter. D. W. Balch, now near Coolgardie, says these camels cost $250 at Fremantle. They carry about 700 pounds each, and can travel three miles an hour for eight hours. They require food and fifty pounds of water daily. On the route is employed 142 camels. The owners of the freight contract propose supplanting the camels by something similar to that herein illustrated.

CONSIDERABLE of our correspondence relates to "mining experts." Some of it is published, illustrating the general trend of opinion. The writer remembers twenty years ago fixing up, with the help of an assayer, a "specimen" and submittiug it to Prof. Frank Stewart, who gravely descanted ou the component parts thereof, and joined in the laugh on himself when its composition was told him. He was a "mining expert," but not infallible. Infallibility is an attribute ordinarily denied poor humanity in any walk of life. But because mining experts sometimes make mistakes; because a good many "mining experts" don't know anything more about mining than mining knows about them, it does not follow that the expert is to be condemned or derided. An experienced miner gifted with intelligent observation, with actual knowledge and careful speech, possessing an earned reputation for honesty, "unawed by influence and unbribed by gain," is not wholly an imaginary creation. Few mining transactions of any magnitude can be negotiated without the employment of what is deemed a reliable man, and the fact that the term "mining expert" is prostituted by numerous frauds should not justly detract from any individual who possesses the qualifications justifying him in claim to the title, though, in general, the real "mining expert" is in no haste to loudly proclaim his right to be so called.

THE newest thing in chemical attainment is acetylene—the commercial synthesis of hydrogeu and carbon. It is a veritable triumph, and was achieved hy means of the electric furnace. The carbide of calcium is an illuminant of the first class, and as a foundry factor it is of almost equal importance.

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J. F. HALLORAN.....General Manager

San Francisco, March 9, 1895.

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It is the province of every well-wisher of California mining interests to expose and oppose every fraudulent mining scheme wherever it shows up. One fraud hurts the county or district more than positive evidence of ten good claims can help it. Of course, the man or the paper doing this must expect to be abused and lied about, but eventually the truth will win.

Without any desire to deter determined men from going toward the Arctic circle in search of gold, it is in order to suggest to those who are contemplating departure to Alaska that the present cheap fares to Juneau should not too strongly influence them. It is pleasant as far as Juneau. Then the real journey and the real expense begins.

The form of industry whose latest development is illustrated by Scheunert et. al. cannot be commended. These enterprising men bonded a mine at Brown's Valley, incorporated, disposed of stock, and when the "innocent purchasers" of the stock, who claim to have believed that the issuers and sellers of the stock owned the mine, found such was not the case, trouble naturally resulted.

Twiggs' steam boiler inspection bill, which among other things provides for a corps of inspectors of the manufacture of stationary steam boilers in this State, may be good in its original intent, but it is believed, were it to become a law, that its practical working would be to put every manufacturer of such machinery at the mercy of men who could use their official position to extort money. The fact that steam engineers are expressly precluded from eligibility for members of the corps of inspectors makes the proposed law still more objectionable. It is a good bill to smother.

Both houses of the Legislature have passed the appropriation for the State Mining Bureau of $50,000 for the coming two years' expenses—sixty per cent of it being stipulated shall be devoted to field work. The bill only requires the signature of the Governor to be effective. He will in all probability sign it as a proper and deserved recognition of the miners and mining interests of California, in which direction the Bureau is doing much good and directing the attention of capitalists outside of the State to its mines. The Bureau will proceed with the publication of the several bulletins that have been held in abeyance pending the action of the Legislature. These bulletins will treat of the following subjects: Mine Drainage, Mine Ventilation, Mine Pumps, Method of Quarrying and Preparing Slate for Market, Electric Power for Hoists, Mill Drills, etc. The demand for the bulletins on Mine Timbering, Cyanide Process, etc., has been unprecedented and they have been of great value to the miners of the State.

The Newly-Found Constituent of Air.

"Argon," the newly-discovered constituent of the air, is the latest sensation in the scientific world. Two years ago Lord Rayleigh found that nitrogen obtained from the air is slightly heavier than that obtained from chemical substances. This fact led him to undertake experiments, in connection with Prof. Ramsey, on the nature of atmospheric nitrogen. In the course of their work they found that when the atmospheric nitrogen is passed over highly heated magnesium the nitrogen is absorbed, and still something is left. This residue will not combine with the magnesium, nor have they been able to make it combine with anything else.

They have devised several methods for the preparation of the substance, they have studied it with great care, and have established beyond any question, as it appears, that it is a substance which has not hitherto been known to exist. It is present in the air to the extent of somewhat less than one per cent. The substance is extremely inactive, and it is due to this fact that it was not discovered earlier. It has always been mixed with the nitrogen obtained from the atmosphere, and, being in some respects similar to nitrogen, it has escaped detection.

The name given to it, "argon," is formed from two Greek words signifying "no work," and referring, of course, to its inactivity.

The substance has been studied, not only by the discoverers, but also by Mr. Crookes, who is an authority in all matters pertaining to the spectroscope. The latter's conclusion is that argon is different from all other substances that have hitherto been studied, and he is somewhat inclined to believe that it is a mixture of two things, both of which are elements. Prof. Olszewski, of the University of Cracow, Russia, an authority on the liquefaction of gases, has determined the point at which argon liquefies, and has shown that it solidifies at an extremely low temperature, forming a mass that looks like ice. He thinks the substance an element and not a mixture.

Taking the sum total of evidence into consideration, it may be said that the balance seems to point to the conclusion that argon is an element.

Gold from Black Sands.

The usual number of new processes to successfully extract gold from black sand is reported. Recent research shows nearly a hundred different machines reported in these columns, many of them of theoretical merit, but scarcely one of sufficient practical value to continue in permanent and satisfactory use. The problem seems so far an unsolved one. The most recent efforts, each one being claimed to be successful, are reported from Oregon and Utah. The latter is purely a quicksilver process, the sand being forced twice through the mercury, with the alleged result of saving sufficient of the fine gold to make the operation profitable. Of this it may be said that if the projector secures success by the use of quicksilver, he has achieved results hitherto denied the most persistent operators in this line of practical metallurgy.

The second claim to the attention of the mining world comes from the north. Under date of February 20th, '95, the men owning and operating the system write to the PRESS:

"We have a chemical process of saving fine gold, and have thoroughly tested it in mining on this beach and on the bars of the Columbia river, and are ready to guarantee that we can save ninety-eight per cent of the free gold contained in any kind of sand or gravel, and wash with either fresh or salt water. We use no quicksilver and can demonstrate that we can save more gold by our system from the same gravel pit than any other process now in use, with the same labor and water. We are not the owners of any mines that are rich in auriferous gravel or sand, but have ground leased here. We save gold that would float away on the water by any other method, and no matter how rusty or greasy or fine the gold is we save it."

The claim that 98 per cent of the gold can be saved is a common one, and, in this case, is probably as much an exaggeration as heretofore. They say they use boxes charged with certain chemicals, costing from $1.50 to $2.50 per month to supply. If these gentlemen can anywhere near approximate their assertions in actual practice, they are to be congratulated. It is possible they have succeeded where so many have failed, and for every reason it is to be hoped that such is the case.

Dividend-Paying Mines.

The item "Dividend-Paying Mines" always makes interesting reading to Eastern people; yet, if they imagine that the published lists represent all the dividend-paying mines of the country, the information is misleading. The tabulated lists give only part of the incorporated company dividends, several of whom advertise the fact of having declared a dividend. But they do represent only a moiety of the mines that pay a dividend, or a profit, for a profit-paying mine is a dividend-paying mine, though some mines that declare dividends are not thoroughly profitable all around. It is impossible for this paper or any other paper to publish a correct list, or even an approximately correct list, of "dividend-paying mines," because, just as in any other branch of trade, the owners do not consider it is anybody's business but their own how much or how little their mine nets them. In this they are right, for no man cares to proclaim the profits of his business purely as a matter of current information, whether he run a mine or a store, a boat or a foundry, a sawmill or a factory. Mining people are no more reticent regarding their financial affairs than any other class. In general, any mine that represents an annual net sum after paying expenses is a dividend-paying mine, the same as any other business. In this way there are several thousand dividend-paying mines. "Up a hollow," or "over in the gulch," or "on the other side of the divide," may be found mines—quartz, drift and hydraulic—whose annual net output makes up the life of the vicinity. Their owners have no brass band; the aggregate yield is rarely seen in print, but the result is noticeable in the securing of the comforts of life, the acquisition of property, and the further development of the mine. These unnoticed mines are the real support of the country and of at least equal value with the much-advertised dividend-paying properties. Besides these are the mines that are yielding princely fortunes, the amounts of which are known to no one but the owners. The best-paying gold mine in this State to-day gives out no figures, but is generally credited with a daily net return of $7500.

Railroad Claims to Mineral Lands.

The famous "Clear List No. 54" has been exploited, and it has been shown that 133,590¼ acres in Sacramento and Susanville land districts are not to be allowed to pass without protest from miners owning unpatented claims therein.

There is another similar attempt at secrecy that needs ventilation. In a little paper in Scott valley appears the following innocent little notice:

TO WHOM IT MAY CONCERN: Notice is hereby given that the Central Pacific, (successor to the California & Oregon) R. R. Co., has filed in this office a list of lands, situated in the townships described below, and has applied for a patent for said lands; that the list is open to the public for inspection, and a copy thereof, by descriptive subdivisions, has been posted in a convenient place in this office for the inspection of all persons interested, and the public generally, viz: Townships 38, 39 and 40 north, range 8 west; townships 37, 39, 39 40, 45 and 46 north, range 9 west; and townships Nos. 37, 43, 44, 45, 46 and 47 north, range 10 west, Mount Diablo Meridian. Within the next sixty days following the date of this notice, protests, or contests against the claim of the railroad company to any tract or subdivision described on the list, on the ground that the same is more valuable for mineral than agricultural purposes, will be received and noted for report to the General Land Office at Washington, D. C. SYLVESTER HULL, Register. LAFAYETTE S. BARNES, Receiver.

That unpretending little paragraph covers, technically, all that the railroad company is obliged to do to absorb unpatented mineral land in fifteen townships in Trinity, Shasta and Siskiyou counties. Sixteen other townships come in the same category.

Every miner who has an unpatented claim in the territory referred to is interested in this matter. The time for filing a protest expires three weeks from to-day. Unless a miner visits the Redding Land Office and sees if the mining claim that he holds is within the limits set forth above, and if so makes protest against the issuance of title, he is liable to lose any right that he possesses and be compelled to make subsequent purchase from the railroad company.

Concentrates.

THE Alice mine in Riverside Co. started up last Monday on $20 ore.

AN electric plant is to be put in at the Eastlick mine, Siskiyou Co.

THE Hughes Creek placer property near Gibbonsville, Idaho, has been sold to St. Paul men for $30,000.

THE Supreme Court of Arizona has filed an opinion to the effect that ore on the damp is subject to taxation.

THE Grant & Omaha Reduction Works are reported contemplating the erection of a reduction plant at Guaymas.

C. L. YOUNG claims to have discovered a 40-foot ledge of cinnabar two miles from the Cleveland mine, near Davenport, Wash.

THE output from the leaching process at the Bi-Metallic mill at Granite, Montana, for January was 73,000 ounces of silver.

IT is reported from Georgetown, El Dorado Co., that a roller mill is about to be added to the Taylor mine plant; capacity, forty stamps.

PERRIS is pleased over the discovery of a gold mine in the Gavilan district, thought to be a continuation of the paying lead in that section.

H. A. HOWARD, now interested in the Cedros Island mines, has bonded several properties twenty miles east of Albuquerque for $200,000.

THE completion of the railroad from Asb Fork, on the A. & P. road, to Phœnix, Arizona, via Prescott, will give Phœnix "a boom" this summer.

THE Marysville *Appeal* asserts that the Anti-Debris Commission will shortly enjoin the North Bloomfield Mining Company from pursuing its mining operations.

THERE are seventy hydraulic mines in operation in Josephine county, Oregon, now, and the number will be greatly increased before opening up for another season.

THE property of the Eureka Mining Co., of Grass Valley, was recently sold at sheriff's sale in Nevada City to J. V. Hunter, formerly of the Providence Mining Co., for $13,739.97.

F. A. HEINZE has bought a half interest in the Rarus mine for $150,000. It is considered one of the best silver-copper properties in Butte. It is developed to the 600-foot level.

THE Calmalli Mining and Milling Company, operating the Ihura gold mines in Lower California, have put on the gasoline schooner Anita between San Francisco and San Domingo.

THE company that recently purchased the McHugh mine on Deer creek below the Home mine, Nevada Co., have a crew of men at work excavating a place upon which to erect a first-class mill.

THE California mineral land classification bill was one of the bills Congress did not pass before adjournment last Monday. The Montana bill passed and was signed by the President.

NONE of the bills introduced in the Oregon Legislature, affecting the mining industry of that State, passed. This is as it should be, as most of the measures proposed would have demoralized the industry.

THE steamship Willapa left Port Townsend on her first season trip last Monday for Alaska with eighty passengers. Every steamer going north is filled with miners and adventurers for the Yukon gold fields.

TWO MEN with the machine so long on exhibition at the Board of Trade rooms in this city are working the beach sands about six miles below the Cliff House, and, it is reported, are making from $5 to $15 per day.

FIRE in the No. 12 mine at Black Diamond, Wash., about 1300 feet from the surface, last Monday, gained such headway as to drive the men out. The head of the stope has been sealed, and steam is being forced into the mine to smother the fire.

BOSTON parties are negotiating for the sale of the Florence & Cripple Creek railway. The price to be paid is said to be $2,000,000. The line was built by Denver capital and cost over $1,000,000, and is paid for, the owners claiming not to owe a dollar.

COL. I. N. MUNCY, of Pasco, and later of Osburn and Columbia river fame, has again appeared on earth—this time on the Coquille river, near the dividing line between Oregon and California. He is working a sand bar near the mouth of the above river.

THE silver mines south of Nogales, in Sonora, are reported running in full blast, and hundreds of tons of ore pass through there every month, consigned to Colorado smelters for treatment. Most of the ore is rich in silver and carries a heavy per cent of lead.

THE coinage executed at the mints of the United States during the month of February was as follows: Gold, $6,143,800; silver, $391,000; minor coin, $57,300; total, $6,692,100. Of the silver coined $200 was in standard silver dollars, the same as during January.

FROM the Broken Hill Proprietary the report for the week ending February 14th says: 8570 tons of ore were treated, yielding 830 tons of lead, containing 218,980 ozs. of silver; also 1306 tons treated by amalgamating and leaching plants, producing 15,838 ozs. of silver.

THE American Developing and Mining Company will build a thirty-stamp gold mill on its property at Gibbonsville, Idaho. The mill is to be double discharge mortars for rapid crushing, the amalgamation being a secondary consideration. The ore is to be crushed to thirty mesh.

WITHIN a radius of twenty miles of Perris there are five mills, and forty-five stamps at work crushing ore. These do not include two prospectors' mills, rotary mills and arrastras, which cut quite a figure. Two years ago the section was scarcely known as a mineral district.

THE Pass Mining Company near Hailey, Idaho, are about to build a new concentrating mill upon ground owned by the Narrow Gauge Mining Company to have a daily capacity of fifty tons of ore that will yield about seven and one-half tons of concentrates. It will be operated by a gasoline engine and work automatically. The ore will be conveyed from the mine to the mill upon a gravity tramway that will bring down ore and haul up supplies and men.

THE Tombstone *Prospector* thinks it is of no use to expect English capitalists to go into mining in the West, or railroad building or manufacturing anywhere, when they can invest their money in American gold bonds and by a little manipulation get eight per cent profit out of them.

EX-MAYOR CHAPMAN, of Oakland, is credited with the statement that on his tract at the headwaters of Suisun bay lie huge deposits of gold-bearing sand which he is going to extract by electrical process. His theory is that the Sacramento has deposited gold there for many centuries.

THE Anaconda Company is negotiating for a hoisting engine that will be capable of raising the regulation weight from a depth of 5000 feet. It is to be placed on one of the hill properties belonging to the company. The contract for this colossal piece of machinery will not be closed for thirty days yet.

THE permit for the Hustler mine, Nevada county, has been suspended indefinitely by the California Debris Commissioners, the broken dam not being able to retain the debris. Permits were granted to the Shealor mine and the Kate Gray mine, near Volcano, Amador county, and the Fine Gold mine, near Vallecita, Calaveras county.

SAN DIEGO county is putting up sign posts in different parts of the desert in that county, which give directions as to distance and position of springs and principal places. If this were done on the Mojave desert several lives would be saved. The miner who risks his life in the search of mines, which are afterward a benefit to many, deserves such consideration.

CAPTAIN CARROLL recently purchased an interest in a mining claim on Annette Island, where the Metlakahtla Indians are located, and will commence development work upon the same next spring, although under strong protest from Rev. Duncan, who is afraid that contact with civilization will corrupt his charges.

THE American company which recently bought the Santo Domingo gold placers, in the Magdalena district, of Sonora, have already spent $100,000 in road-making, machinery purchases and other preliminary work. The ground to be exploited comprises 200 claims of a hectare each. The hydraulic method is to be employed.

WILLIAM WOODBURG, prospector, returned from a 900-mile trip from San Bernardino, ranging across the Mojave Desert to Death Valley and down through the San Jacinto mountains and across the Colorado desert. He located seven ledges. He says that in Pinon valley a two-stamp mill pounds out $4 an hour, some of the quartz yielding $1000 per ton in gold.

THE Senator Consolidated Gold Mining Company has under consideration a proposition to issue bonds and pay off the indebtedness of the company, amounting to nearly $10,000. *Mining Industry*, of Denver, speaks of the mine as one of the prettiest propositions in the country with which to fool a company, as the ore is rich on top and lower grade as depth is obtained.

THE success of the new reduction plants at and in the vicinity of Cripple Creek, for the handling of low-grade ores, is giving a market value to a class of material which heretofore has been unprofitable and either left in the mine or thrown on the dump, but which equals or exceeds in tonnage the high-grade or former shipping ores of the mines; this applies to all the low-grade ores of the gold mines of Colorado.

COL. CASEY killed the appropriation bill for the Cal. Debris Commission in his report to the River and Harbor Committee, wherein he said: "There was an unexpended balance on hand on January 31, 1895, for the purposes of this Commission, amounting to $7893. The expenses of the Commission from May 3, 1893, to January 31, 1895, amounted to $7107. I see no reason at present for making a special appropriation for the Commission."

THE new British Columbia mining law not only does not include the alien clause, but restores to the miner a privilege that he has long contended for, the surface right and timber privilege with each mining location. Heretofore the right to the surface has been denied to a British Columbia miner, even under a crown grant. A railroad could come along and cut off the trees and the miner would be obliged to go miles, sometimes, for timbers for his improvements.

THE Revenue mine in Madison county, Montana, one of the richest gold mines in the State, was sold last week by Butte parties to a Denver syndicate for $50,000, and, directly after the sale was perfected, it was announced that the Denver people had sold the mine to an English syndicate for $250,000. The mine originally belonged to Boston parties and was sold at sheriff's sale a year ago for $11,000. The mine has yielded handsome returns under a lease the past six months.

M. F. CAMPBELL, of the Gunsight mine, near the line of southern Arizona, says the camels of the desert, introduced many years ago by Ben Butterworth and now grown wild, are increasing rapidly, now numbering three or four hundred. The camels roam on lands between the Gila and Colorado rivers. They are kept in good condition by the fine bunch grass, and are often killed and palmed off for beef. They are often captured for circus purposes, and are easily trained.

THE Cœur d'Alene *Miner* says that the reported sale of the Tiger and Poormau mines to an English syndicate is utterly without foundation. Negotiations have been pending for many months between the owners of the four principal mines on Canyon creek and the English syndicate in question, but about two months ago, says Mr. Clark, manager of the Poorman, they came to an end simply because the terms of sale of the properties could not be agreed upon by all concerned.

THERE has been presented to the Academy of Sciences, in this city, a fine collection of Japanese rock crystals, consisting of many beautiful specimens in various shapes. Some are beautifully carved in fantastic designs. The gem of the collection is a large crystal sphere, seven inches in diameter. An idea of the immense power of the crystal can be formed when it is understood that, if the rays of the sun were focused through it on gunpowder, an explosion would occur in the fiftieth part of a second.

THE new Montana mining code makes some changes in the method of making quartz and placer locations. A shaft or tunnel ten feet deep must be dug before the location notice can be recorded; this shaft must always reach to solid formation. The time for recording is extended to ninety days after locating instead of twenty days, as at present. In case of relocation, if the old discovery is used, it must be sank ten feet deeper. A new provision is that the locator may, if he desires, have a United States depaty mineral surveyor make a survey of the claim before location notice is recorded, and, if the field notes of the survey are attached to the recorded notice, they are prima facie evidence of the truth of the matters contained therein.

AT 5:48 last Sunday morning an immense aerolite shot out of the northern heavens and seemingly passed over Reno, Nev. It exploded with terrific force, shaking buildings and awakening people. Those who saw it describe it as a magnificent sight, lighting up the heavens and earth in all directions. It was accompanied by a whirring noise, like a tornado. The people on the street involuntarily dodged. It was probably at a great distance, as the explosion "was not heard for two minutes after it dropped."

THE Debris Commission last week gave permission to the following persons to operate hydraulic mines: James Slater, mine near Brownsville, in Yuba county; Giani D. Martini and others, Railroad Hill mine, near Fort Crossing, in Calaveras county; George H. Poase and J. H. Colwell, North Rim mine, near Yankee Jim's, in Placer county, the applicants having agreed to construct dams to bar the exit of debris or to use dams adjoining the mines. About twenty more applications are to be considered.

IN order to make room for minerals, several of the noted objects of the museum of the Mining Bureau on Fourth street in this city are being sent out to the Golden Gate Park museum, viz: The marble figure of Rebecca at the well, belonging to J. Z. Davis; the Egyptian mummy has also gone to the park for a more salubrious atmosphere; the baboon that has so long grinned at Rebecca from his glass case that he now misses her society, will soon follow, as will several more large objects that occupy space which will hereafter be devoted to additional minerals.

THERE is now being advertised in the Redding *Democrat* land claimed by the railroad, and unless action is taken in the shape of a protest by the 30th inst., patents will issue, notwithstanding that it comprises a large amount of mineral land. Five townships are in Trinity Co.—townships 34 and 35 N., R. 7 W., 31 and 33 N., R. 8 W., and 32 N., R. 9 W. The fact that the land is mineral makes no difference. The miners interested should file a protest at Redding before the 30th, or expect, unless they already have patented claims, to be called upon to get title from the railroad company later on.

LOCATION NOTICES written in lead pencil last longer than those written in ink. A notice written in ink, and posted at a mining location on paper, will last about one year, while a pencil notice will last as long and be as plain as the paper upon which it is written and will stand the elements of the weather. A notice written on a board or the smooth side of a stake in pencil has been known to last for fifteen years. For some reason or other a notice written in ink soon becomes obliterated by snows and stormy weather and is soon unintelligible, while pencil writing is not defaceable by anything other than intentional destruction.

IN Missouri in '94 the average price of zinc ore was $5.57 per ton less than in '93, while the price of lead dropped $1.86 per ton. Lead and zinc ore is produced in ten counties in that State and in all 563 shafts are operated. The number of tons of lead ore mined during the year was 52,003, valued at $1,949,568, and of zinc ore, 89,150 tons, valued at $1,337,910, making a total for the two of $3,287,478. The average price per ton paid for zinc ore was $15, and for lead ore, $37,48. There were 5065 men employed during the year, of which 3421 were miners. Seventeen miners were killed during the year and twenty-nine non-fatal accidents occurred.

IN a decision on appeal of the Silver King Mining Company, from the Secretary of the Interior, it is decided that a certified copy of the certificate of incorporation of a mining company is sufficient to file with an application for patent, and not a copy of the articles of incorporation. The Commissioner of the General Land Office has been in the habit of calling for copies of such articles from time to time, in the face of the law, thus putting applicants to much useless delay and expense. Copies of such articles generally cost from $10 to $15, whereas the copy of a certificate of incorporation only costs $1.50. This decision settles the point definitely.

A MELBOURNE, AUSTRALIA, paper tells a story about Coolgardie which may not be true. A party struck it very rich, and one of their number was dispatched to London with the specimens, upon the strength of which a company was floated with a large capital, a fine slice of which went to the vendors. The legal managers telegraphed out to the man in charge to start crushing at once. He waited patiently for results, but received no reply. Several times he wired to the same effect, with no better results. Then he sent a more urgent message, as follows: "Shareholders indignant that no report received from you. Acknowledge this, and commence crushing immediately." This elicited a reply, as follows: "Your wires duly received. Cannot commence crushing till you send back the reef."

A GOOD DEAL is said in mining items from the Slocan country, B. C., about "rawhiding" ore and other freight. The "rawhiders" take cowhides just as they are skinned from the slaughtered animal. Any rough edges may be trimmed off. Holes about one inch in diameter are cut about one foot apart around the edges, the hide is laid flat on the ground and the sacks of ore piled thereon. Some rawhiders place two sacks side by side and some three. After the hide is loaded the ends and sides are drawn together by a rope passed through the holes as described above. In this manner the load is laced tightly in the hide. The neck of the hide is always the front and to it is fastened the whiffletree. If the trail is very steep, one or more loads of sacked ore are hitched one behind the other and the mule started down the trail on the run. For extra steep pitches in the trail a rough lock, consisting of a steel chain, is fastened around the load. All supplies for the miners are hauled up the trail by rawhide transportation. So expert do the rawhiders become that they balance themselves standing on top a loaded hide while the mule is going down a steep mountain side on the dead run. The mules themselves soon learn where to stop for the rough lock to be applied, and it is said by various chroniclers of the Slocan that some rawhiders have their mules so well trained that they sit down on the load and shoot over the steepest places, thus making rough locking unnecessary.

California Scenery.

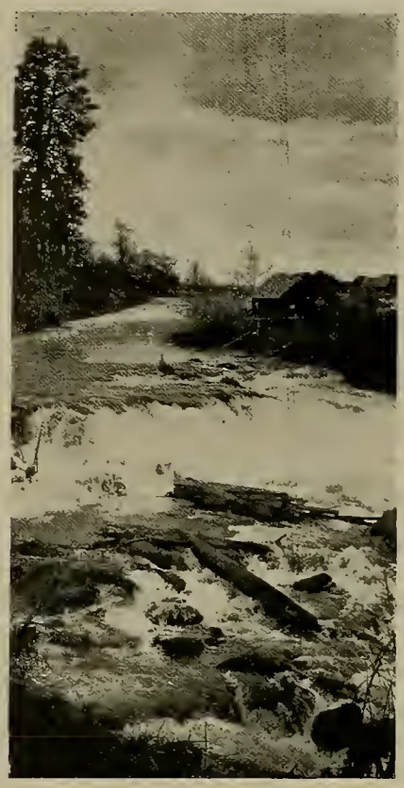
The engravings on this page display two widely different features of Pacific coast scenery. One is of Fall river—a mountain stream in the extreme north—which pours its waters into Pitt river and thus makes its contribution to our great Sacramento. An appreciative writer speaks of its region in these words:

"Fifty miles southeast from the upper McCloud Falls, across measureless earthquake upheavals, traversed in midwinter on snowshoes, the road steeply descends into Fall River valley. A serene panorama of vernal plain and slow-creeping rivers greets the eye restfully after the exciting exaggeration of mountain landscape beheld for a fortnight. To the right, beyond leagues of bright meadow, a cluster of lakelets bubble out of the loose lava crust which covers the northeastern corner of California. These small, brimming basins are the terminal flowers of branching stems of the Fall, Bear and Tule rivers. Fall river is the longest in view, dropping its unrippled coils down an emerald space of valley until, coming suddenly upon the dark, sluggish Pitt, it leaps to that sullen current in a delirious frenzy of shrilling, foaming cascades. The quickening is instantaneous. The Pitt is transformed into a roaring torrent, speeding straight for an austere line of ashen cliffs."

That treats of Fall river in its wilder aspects. The photographer whose view we present caught it in its milder moods, where it turns mills and ministers to the service of cultivation.

The other engraving on this page presents another river scene in central California. The hard, smooth roadway amid rocks and trees and wooded slopes, with vistas of the river below, suggest to the denizen of coast or valley the pleasures of summering in these higher altitudes. The river in this case is the Tuolumne, as it leaves that county's borders; but the view is merely typical of hundreds in the foothills of the Sierra Nevada on the California side, and all who have enjoyed them will find their impressions reflected in these lines of one who evidently appreciates such scenes:

"The landscape spread before us always was, from an artistic point of view, beautiful. Continually we get glimpses of the distant Sierra covered well with snow, and the effect upon the more quiet aspect of the near landscape was to lend a feeling of expanse and dignity to it all, which is scarcely to be conveyed by words. There is a sense of vastness about all California landscape which takes quiet possession of an appreciative beholder, in a way that is somewhat remarkable. The long, dry summers fill our air with a tremulous, lilac-toned haze that gives an air of mystery and distance which I have never seen in any other land. This is aided by the openness of the skies day by day, their rich, warm blue and violet tones only accented by an occasional streak or tuft of wandering cloud that appears to be at an immense distance aloft. The eye wanders over a vast wealth of detail in hill, mountain and woodland, diversified by a great variety of tree growth and flora."



SCENE ON FALL RIVER.

A GLIMPSE OF THE TUOLUMNE RIVER.

Prices for Armor Plate.

The prices paid for armor plate, according to a recent communication of the Secretary of the Navy to the United States Senate, are as follows: For American ordinary armor plate, $500 to $575 per ton; for "special" armor, $600 to $725; cost of treating by Harvey process, $61.60 per ton additional. The "compound" armor, purchased at Sheffield, England, for the Miantonomoh, is said to have cost $535 per ton. The nickel-steel armor made in the United States contains 3.25 per cent of nickel; that made abroad contains from 2 to 2.25 per cent. The Secretary calls attention to the fact that foreign armor is made in various grades and of various prices, and that the bids of English and French armor manufacturers for armor for foreign use are much lower than for armor for ships of their own nationality. The contracts with the United States makers are more severe in many respects in their requirements for acceptance than those abroad.

Engineers Are Officers.

Geo. W. Melville, Engineer-in-Chief of the U. S. Navy, has this to say on the mooted question of the right of engineers to the title of "officer":

The *Century Dictionary*, regarded as the best modern authority on the meaning of words, defines an officer to be "One who holds an office, or to whom has been intrusted a share in the management or direction of some business or undertaking, such as a society, corporation, company, etc., or who fills some position involving responsibility, to which he has been formally appointed." Is, or is not, the engineer of a steamship an officer within the meaning of this definition? His position unquestionably fulfills both of the requirements of the definition, for he is certainly intrusted with a share in the management of the undertaking, i. e., the steamer, and in the second place, no one who has ever been on board a steamer at sea can deny that the engineer's position does not involve responsibility.

The claim of the deck, or sailor, officer to being an officer is based upon inheritance from a condition of things now obsolete rather than upon any real importance or responsibility involved in his present position. In olden times, and on sailing vessels to-day, the master and mates held a position of serious responsibility, and were charged with the sole management of their ships, but that condition does not now exist on the steamers that are now engaged in carrying on the world's commerce. The finest example of modern steamships, notably the Atlantic "greyhounds," and the swift mail steamers of the East India trade, are absolutely without sail power, and even without masts, except for signaling purposes, a development that has removed a heavy load of responsibility from the deck officer, and has reduced him in practice to the status of a watchman or lookout. He no longer has to scan the horizon in fear of being knocked down by a sudden squall, nor is he required to be constantly vigilant and worried lest the change in the wind or an unequal press of canvas bring his masts and spars down about his head, possibly to the peril of the ship itself. Beating through a crowded harbor, clawing off a lee shore in a gale, or skillfully bracing his yards to avoid collision, are all dangers and cares from which he is relieved, and of which he may have no knowledge except that acquired by reading old sea tales. In this day of steam, the engine-room telegraph is his panacea for all troubles, and if he knows how to throw its pointer in the right direction, another more responsible than himself comes to the rescue. Literally, he touches the button and the engineer does the rest. Instead of nervously and carefully watching the rigging and spars and the ship's course, his responsibilities are now reduced to an occasional admonition to the man at the wheel, and to keeping a lookout ahead. If he sees a vessel, iceberg, or other obstacle in his path, he rings the engine-room bell and is safe. A pilot takes him in and out of port, and is responsible while on board.

On the other hand, the responsibility which once haunted the watcher on deck has now found a place below, and the engineer goes through his watch oppressed with a load of cares fully as heavy as that once borne by the deck officer. Instead of overpressed sails and bending masts, he has to regard a battery of huge boilers, each charged almost to distortion with a tremendous pressure of steam, and each in itself a magazine whose explosion would rend the ship in pieces, and a set of great engines equally overcharged and carry on them a multitude of details infinitely more complex and vital than ever was the network of rigging by which the sailing ship was controlled. I remember seeing in print once a letter from a sailor officer, sadly deseanting upon the decadence of the times and announcing, with a show of anger, that the claim of the new-comers to the rank of officers was an insult to the "sea profession." The "sea profession," indeed! What is it at this close of the nineteenth century, but marine engineering!

A SATISFACTORY balance to the credit of the Patent Office appears in the annual report of that branch of the Government for the year 1894. The excess of receipts over expenditures for the year amounted to $87,392, which, added to the amount of previous balances, shows a total of $4,369,135. During the year 36,987 applications for patents were received and 20,803 patents were granted. It appears that in proportion to population more patents were issued to citizens of Connecticut than to those of any other State—one to every 993 inhabitants; and next in order came Massachusetts, with one to every 1335 inhabitants, and the District of Columbia, with one to every 1379 inhabitants. New Jersey, Montana, Rhode Island, New York and Colorado followed in the order named. The smallest number of patents in proportion to the number of inhabitants were issued to citizens of South Carolina, Mississippi, North Carolina, Arkansas and Georgia, following in that order.

A PECULIAR fatality is reported from the East Norrie iron mine, near Ironwood, Mich. The mine is lighted by electricity, and the wires are usually carried through iron pipes. A timberman named Jacobson, while working in a shaft, sat on one of these conduits, and placing his hands on the conduit, received a shock causing his instant death.—American Gas Light and Coal Journal, Feb. 16th.

GOLD is coming into the mint from mines of this State at the rate of a million dollars a month.

Australian Gold.

D. W. Balch, formerly a well-known Comstock assayer, is now among the Australian gold fields. In a letter written from Sydney, N. S. W., to an old friend in Virginia, Mr. Balch describes the prospects and methods of that country in a highly interesting manner. The letter in part is as follows:

"Bratnover and Callighan were sent out here by an English mining gang and they have been out to Murchison, Coolgardie way, for the past three months, but are here now. They speak well of the country, but say that at present they ask too much for their claims; besides, just at present it is very hot and sickly there. They both say they never saw such a country for ledges—there are thousands of them. Some of them stand up from twenty to fifty feet high. Some of them are very remarkable for their phenomenal richness.

"There is a man here in the city now by the name of Mills who found the Londondery. It was sold the other day for $900,000. He got $300,000 as his share. He is an Irishman, who never mined before in his life, can't read or write, but they say is quite shrewd. All the old prospectors warned them not to go where they did, as they knew there was nothing there. As they were all dead broke and could not get away from Coolgardie, they had to prospect within a mile of the city. I don't know how much they took out in a few days, but it was a very large amount. As they could not agree about working the mine, none of them ever having mined, they sold the claim.

"New finds are being made all the time, and now the prospectors are in places 100 miles from Coolgardie. The country is without water, except salt lakes, and the water in the shafts is brackish when found. Condensers are run all over the country, and the whole country is covered with a thick low brush, called "mallee scrub." People are getting lost all the time, and you hardly take up a paper without reading of some one being lost in the brush. The country is all gold bearing from the Murchison to Coolgardie, 500 miles, and it is thought it will take five or ten years to prospect it. In fact, they have not yet begun to prospect Australia, as gold is found all around the continent—8000 miles—and they have only prospected about 500 miles in from the coast.

"All around it leaves about 1200 miles of unprospected country in the interior. I had always thought that the interior was a sand desert, but such is not the case. Very few sand deserts are in the country, but the interior is covered with this dense scrub and water holes are scarce; but all over the country water can be found by digging wells from 30 to 200 feet deep. As a sample of what is in the interior and at present undeveloped, I heard of a prospecting party of ten, with eleven camels, which left Adelaide, Southern Australia, about a year ago. They paid out $7500 and brought back 400 ounces of gold that they knocked off ledges that they found.

"All the mines that have been sold so far at Coolgardie have been sold on their report. From what I can hear I think this excitement will keep up for a long time yet, as all persons who come back that know anything about mines agree that the country is good, but it will take lots of money to develop it. It is time to go there in a year or so from now. It is about 3000 miles from Coolgardie to here, 2500 by steamer to Fremantle and 500 from there by rail and stage. Go as fast as you can and it takes over two weeks to get there and costs all of £100."

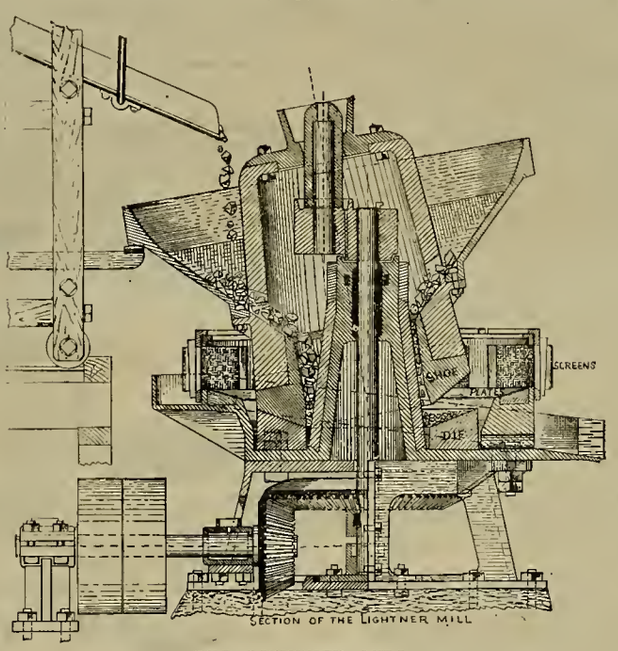
Building Guns More Cheaply.

The very heavy cost of modern guns is largely due to the time and labor which are necessarily expended upon the operation of rifling them. The material itself is relatively cheap, and a rifled gun, besides being much more costly, is, other things being equal, more short lived than a smoothbore. It is almost impossible so to make the gun and the projectile that the soft driving bands of the latter shall, at the moment of discharge, accurately fit into the grooves and lands of the bore and allow no gases to pass ahead. When these gases do pass ahead of the projectile, they score and damage the interior of the gun, and where the new powders are used and the gases of combustion attain an enormous degree of heat, the process of deterioration, especially in weapons of large caliber, is often very rapid.

A Swedish engineer, W. T. Unge, has devised a method whereby he hopes to save not only the cost of rifling, but also the interior wear and tear for which rifling is responsible. He proposes to construct all guns with smoothbores and to fit the projectiles with gas checks, which shall render it practically impossible for any gases to rush past them. In order to convey to the projectile an axially rotary motion, such as is at present conveyed to it by the action of the rifling, he has invented a mechanical arrangement which, at the instant of firing, gives to the gun itself the rotary motion. This may be either constant or increased. He has satisfied himself that the effect upon the projectile is exactly the same as is produced by the constant or increasing twist of an ordinary rifled gun, and he is of opinion that the adoption of his system, while giving equal or even improved accuracy of fire, will reduce the cost of heavy guns by one-half and add enormously to their endurance.

The Lightner Mill.

The Lightner quartz crushing and grinding mill is herewith illustrated, giving a sectional view. The operation of the mill is as follows: The rock is fed from an automatic ore feeder into the hopper which surrounds the gyrating muller, from which it passes through ports or holes to the inside of the muller, where it is crushed between the muller and the central cone in the mortar, then, dropping to the bottom of the muller, is ground between the muller shoe and die in the mortar. The water is fed in with the rock and flows from the center, carrying the finely ground materials with it towards the discharge screens, which are all around the outside of the mortar. The motion of the muller causes a strong wave-like splash against the screens, securing a quick discharge. Amalgamating plates are secured on the slope between the die and the discharge, and the peculiar motion of the pulp, washing to and fro over the



THE LIGHTNER MILL.

plates, makes the mill a first-class amalgamator. In addition to the gyrating motion, the muller has a rotary traveling motion and a side-slip radial motion on the die. These mills run at a speed of from 80 to 130 or more revolutions per minute and will work any kind of hard rock or dirt, to any degree of fineness, depending on the screens.

The advantages claimed are: Cheapness of first cost and operation, slight cost of wearing parts, slight cost of future maintenance, slight wear of metal to quantity of rock crushed, ease with which it can be cleaned up; automatic feed can be applied; no large rocks can be thrown against screens; two places requiring oil; quick discharge, preventing sliming; the large percentage of gold saved in the mortar, making an extreme area of outside plates unnecessary; damage to mill impossible from increase of speed; no oil can reach pulp; requires very little power to drive mill.

In a Ton of Coal.

From one ton of ordinary gas coal may be produced 1500 pounds of coke, 20 gallons of ammonia water and 140 pounds of coal tar. By destructive distillation the coal tar will yield 69.6 pounds of pitch, 17 pounds of creosote, 14 pounds of heavy oils, 9.5 pounds of naphtha yellow, 6.3 pounds of naphthaline, 4.75 pounds of naphthol, 2.25 pounds of solvent naphtha, 1.5 pounds of phenol, 1.2 pounds of aurine, 1.1 pounds of benzine, 1.1 pounds of analine, 0.77 of a pound of toludine, 0.46 of a pound of anthracine and 0.9 of a pound of toluene.

From the latter is obtained the new substance known as saccharine, which is 530 times as sweet as the best cane sugar, one part of it giving a very sweet taste to a thousand parts of water.

The Curse of Official Indorsement.

If there is any one thing which public officials of all classes should avoid, in their capacity as officers, it is the practice of indorsing certain enterprises and schemes. Many a wildcat financial scheme has been foisted on the public through the intentional or unintentional indorsement of some man holding a public office.

Men with fertile brains will incorporate some investment or other kind of company, and the first thing they do is to get the indorsement of some man in public life. This is often done by securing his name as a stockholder, which is done by presenting him with a few shares of the stock. With this apparent indorsement they sally forth and soon the public is persuaded to invest in the new concern, one of the great arguments used being that Mr. So-and-so, high in official circles, has enough confidence in it to take stock.

Men in public life, it matters not what position they occupy, owe a duty to the people they represent, and when they, intentionally or unintentionally, lend their names to enterprises which they do not know to be absolutely legitimate, they are certainly derelict as public officials.—The Investor.

A Candid Concession.

"Can Americans tin their own plates now?" was the significant inquiry recently made by a reporter of one of the Welsh newspapers to T. Phillips, secretary of the Welsh Tin Makers' Association. "Yes," was the reply. "They manage all the processes. On the other side of the Atlantic they are apparently laying down heavy machinery. For example, their standards in the mills weigh thirteen tons as compared with four tons in Wales. Evidently they think it will pay to have the machinery well laid down." Here in truth is testimony to the superior design of American tin-plate rolling mills out of the mouth of a Welsh official which deserves to be recorded, and upon which American makers may fairly flatter themselves without laying themselves open to any of the charges of boasting which Britishers are still so fond of bringing against transatlantic cousins. "What do you think, Mr. Phillips, is the prospect of the future manufacture of tin plates in America?" was the interviewer's next inquiry. "The Yankee will probably make 2,000,000 boxes and then he will stop and look around to see what profit he has made," was the answer of this master's secretary.

Wood in War Ships.

The board convened by Secretary Herbert to consider the subject of dispensing with wood in the construction of the naval ships now building, and also for the purpose of finding some suitable substitute for wood in places where it is impracticable to use metal, of which board Commander Bradford is senior member, is said by the Philadelphia *Ledger* to be making fair progress. Since the naval action fought off the mouth of the Yalu river between the Chinese and the Japanese fleets, during which several ships were disabled and thrown out of action by serious fires on board, the matter has received much attention at home and abroad. The German admiralty has convened a board to find some proper substitute for wood. In the meantime the use of wood has ceased altogether, even the furniture being made of iron, and cork used where a non-conductor is absolutely necessary. The English have not yet taken any definite action, but are casting about for some substitute for wood. The French have for a long time used a minimum of wood, and in all foreign ships less wood has probably been used than in those of our service.

Ship Building Wages.

C. H. Cramp gives the following comparative table of current wages here and in Great Britain in shipbuilding:

	United States, per week.	*Great Britain, per week.*
Pattern makers	$18 00	$9 00
Machinists	15 00	8 50
Boiler makers	15 00	8 50 to 9 00
Clippers and calkers	15 00	7 80
Riveters	12 00 to 14 00	7 50 to 8 00
Beam and angle smiths	15 00	8 40
Fitters up	15 00	7 80
Ship carpenters	18 00	9 60
Joiners	16 50	9 00
Painters	18 00	9 60
Coppersmiths	18 00	8 60 to 9 00
Shipshed machinemen	15 00	7 20
Furnacemen	11 00	6 00
Holders on	9 00	4 20 to 4 80
Riggers	11 00	7 00 to 7 20
Plumbers	18 00 to 19 00	9 00 to 9 60
Drillers	11 00	6 40
Sheet iron workers	15 00	8 50
Molders, iron	14 50	9 00
Molders, brass	15 00	9 00
Laborers, as helpers	9 00	5 20
Laborers, as handlers	8 00	4 20

COBALT NITRATE is found by Dr. Johann Antal, a chemist of Hungary, to be an antidote to prussic acid and cyanide poisoning. First he tried the cobalt on animals, and then, presumably at different times, on forty living persons who had been accidentally poisoned by prussic acid, and in all cases the results are reported to have been satisfactory.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XXIV.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

Sir William Hamilton mentions the lake Mare Morto, Fol. 150, near Point of Misenum. "Under the ruins of an ancient buildiug, in a vault, there is a vapor or 'mosete' exactly similar in its effects to that of the Grotto del Cane, as I have often experienced." Referring to Mount Ætna, he says: "A very powerful mosete has recently manifested itself in the neighborhood of Ætua, and near the spot whence it rises animals, birds and insects are found dead, and the stronger sort of shrubs blasted." (Fol. 166, Observations on Mount Vesuvius, 1782).

In a paper read before the Royal Society, Jan. 15, 1795, the same anthor treats more fully the subject of "mephitic vapors," from which the following are extracts: "After every eruption of Vesuvius we read of damage done by mephitic vapors, which, coming from under the ancieut lavas, insinnates itself into such low places as cellars and wells of houses situated at the foot of the volcauo. After the eruption of 1767 I remember that there were several instauces, as in this: of people going iuto cellars as in Portici and other parts of that neighborhood, having been struck down by this vapor and would have expired had they not been hastily removed. These occasional vapors, and which are here called 'mosete,' are of the same quality as that permanent one in the Grotto del Cane, near the lake of Agnano, aud which has been proved to be chiefly fixed air (carbonic acid gas) (Fol. 106).

"The vapors which in the volcanic language of the country are called 'fumaroli' are of another nature, aud issue from spots all over the fresh and hot lavas while they are cooling. They are sulphurous and suffocating, so much so that birds that are flying over them are overpowered and fall down dead. * * * The first appearauce of the mosete after the late eruption was on the 17th of June, when a peasant, going with an ass to his viueyard, a little above the village of Resina, in a narrow way, the ass dropped down and seemed to be expiring. The peasant was soou sensible of the mephitic vapors himself, and well knowing its fatal effects, dragged the animal out of its influeuce and it soon recovered. From that time these vapors have greatly increased and extended themselves. There are to this day many cellars aud wells all the way from Portici to Torre del Annunziata greatly affected by them.

"This heavy vapor, when exposed to the open air, does not rise much above a foot from the surface of the earth, but wheu it gets into confined places like a cellar or well it rises and fills them as any other fluid would do. Having filled a well, it rises above it about a foot, aud then, bending over, falls to the earth, on which it spreads, always possessing its usual level.

"Wherever this vapor issues a wavering in the air is perceptible like that which is produced by the burning of charcoal, and when it issues from a fissure near any plants or vegetables the leaves of those plants are seen to move as if they were agitated by a gentle wind.

"It is extraordinary that, although there does not appear to be any poisonous quality in this vapor, which in every respect resembles fixed air, it should prove so very fatal to the vineyards, some thousauds of acres of which have been destroyed by it since the last eruption. When it penetrates to the roots of the vines it dries them up aud kills the plants.

"A peasaut in the ueighborhood of Resina, having suffered by the mosete, which destroyed his viueyards in the year 1767, and having observed that the vapors followed the laws of all fluids, made a narrow, deep ditch all around his vineyard which communicated with ancient lavas, and also a deep cavern under one of them. The consequence of his well reasoned operation has been that, although surrounded at present by these noxious vapors which lie constautly at the bottom of his ditch, they have never entered his vineyard and his vines are now iu a flourishing state, while those of his neighbors are perishing. Upward of thirteen hundred hares and many pheasants and partridges, overtaken by this vapor, have been found dead within his Siciliau Majesty's reserves, aud also many domestic cats, which, in their pursuit of game, fell victims to the mosete.

"A few days ago a shoal of fish of several hundred pounds weight, having beeu observed by some fishermen at Resina in great agitatiou on the surface of the sea near some rocks of an ancient lava that had run iuto the sea, they surrounded them with their uets, and afterward discovered that they had been stunned by the mephitic vapors which at that time issued forcibly from underneath the ancient lava into the sea."

(To be continued.)

The Solar Eclipse of '93.

Professor J. M. Schaeberle, of the Lick Observatory, gave an interesting accounnt last week, before the Geographical Society of the Pacific, of his expedition to Chili two years ago, to observe the total eclipse of the sun. Of all the parties sent out to differeut parts of the world, this one obtained the best negatives. The story of the toilsome advance up the rugged Cordilleras, the difficulty of transporting the instruments as the men pauted in the rarified air, and the suffering in the icy blasts of the high altitudes, where the wind was almost a hurricane, were described by the lecturer with a force and vivid earnestness that held the large audience closely attentive till the end. The camera slides, illustrating the eclipse and many landscapes amoug the Audes, were well doue and gave great enjoyment. It is the professor's judgment that neither magnetism nor electric force has anything to do with the coronal display.

Books Received.

The Heating Power of Wyoming Coal and Oil, by E. E. Slosson: from the University of Wyoming.

The Discovery of Mineral Deposits in the Lake Superior Region, by H. V. Winchell.

The Twenty-third Annual Report of the State Geologist of Minnesota, by N. H. Winchell.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from A. Blair, in the American House Mine, near La Porte, Plumas Co., Cal., to impound tailings behind dams in the American House Ravine; from Jay E. Russell, in the Spring Tunnel and Spring Canyon Mines, near Mount Gregory, El Dorado Co., Cal., to impound tailings behind brush dams in Spring Canyon; from Porter Phillips, in the Mount Gregory Gold Mine, near Georgetown, El Dorado Co., Cal., to impound tailings behind brush and log dams in a ravine below the mine; from Wulff Bros., in the Deer Valley Mine, near Green Valley, El Dorado Co., Cal., to impound tailings in an old hydraulic pit; from John Enos, in the Strawberry Placer Mine, near Vallicita, Calaveras Co., Cal., to impound tailings behind rock dam in a gulch below the mine; from Geo. R. Evans et al., in the Red Hill and Telegraph Hill Mines, near Rancheria, Amador Co., Cal., to impound tailings behind log dam in Chili Gulch; and from Moy Jin Mun, in the Grizzly Hill Mine, near Volcano, Amador Co., Cal., to impound tailings behind brush dam in a ravine below the mine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on March 18th, 1895, at 1:30 P. M.

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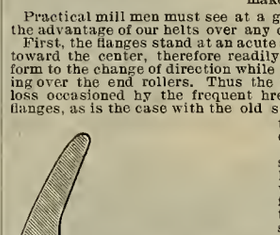

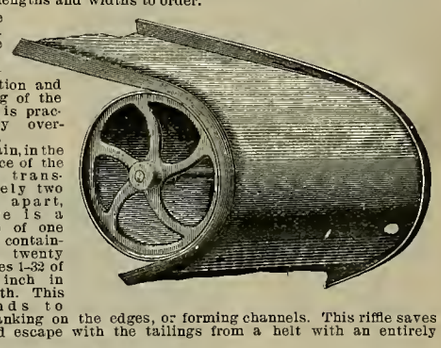

Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from hanking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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En Passant.

A meeting has been called under the patronage of the Board of Trade, the Chamber of Commerce and the Mechanics' Institute, to consider the matter of local manufactures.

This movement proceeds from motives unquestionably good. One way to create home manufactures is to withdraw from the banks some of the money there lying idle and put it into shoe-making shops, implement factories, cloth-making and clothing-making establishments, etc., etc. The masses do not need to be educated so much as the capitalists. The masses are the buyers and they will buy where they can buy cheapest, and no system of "education" will make them do otherwise. Let capital do its part and the consuming masses will do theirs.

This regeneration of San Francisco is chiefly to be hoped for at the hands of her capitalists. Whatever has been accomplished in California in the past forty years has largely been absorbed by them. They are not, as capitalists go, a bad set of men, but they are deficient in just the sort of skill needed at this time. They are not, as a rule, men trained in business. Their wealth has very largely been acquired by inheritance, in speculation, by increase in the value of real property and by mining operations. So far as we know, there is not a good mechanic in the whole list of millionaires; and it is a very unfortunate fact. Just think what it would mean for California if her younger millionaires—leaving out of the question the older men, who are past an active life—had each some special business equipment! If Fred Sharon were a leather maker we should probably have the biggest and best tannery in the world. If young Phelan had been trained in the machine trade we might have an establishment which would build those forty-two locomotives for the S. P. If Charley Fair were an expert miner, it would set a thousand stamps to dropping. If Jimmy Flood were a shoemaker, the hide product of California would be consumed at home and "the masses" would walk in California-made shoes. Generally speaking, our great fortunes are employed in land speculations, in banking or in other ways which contribute little or nothing to the welfare of the city and State. The capitalists of San Francisco also need to be educated. And that the process is well in progress, and that it promises the best results, nobody can doubt who watches the movements of the times.

Obituary.

B. F. Bachman, an early pioneer of Los Gatos, who died last week, was one of the party that discovered the Yosemite valley in March, 1851.

Fred Oest, owner of the famous Oest mine at Silver City, died in this city last week. His mine has produced over $500,000 in gold, and at the World's Fair took first prize for gold specimens. At the time of his death Mr. Oest owned a half-interest in the mine.

John J. Devine, one of the best-known mining men in southern Arizona, was found dead in bed at a hotel in Florence, Arizona, on the 1st. He made and lost several fortunes in the mining business in the Territory, and at the time of his death was superintendent of a company which controls rich gold properties.

K. A. Denison, a prominent assayer and mining man, of Leadville, Colo., died February 26th from accidental poisoning. While taking lunch in his office he filled a tumbler with water, thinking it was clean. It contained four or five drops of cyanide of potassium, and he died in an hour. Mr. Denison was a popular man, and was to have been married in a month. His mother resides in Geneseo, N. Y.

A Sweeping Decision.

An absolute removal to all bars to the use of the carbon telephone transmitter; the destruction of exclusive rights to manufacture and sell the incandescent light; the denial of right, alleged under an Edison patent, to impose a royalty upon every street railroad or any other enterprise using electricity for power or light; the collapse of claims for royalty for the usé of machinery in the rubber industry and probably in numerous other industries; the probable beginning of suits for the recovery of royalties paid under patents now decided to have expired—these are some of the results of the decision handed down by Justice Harlan last Monday in the Bate-Sulzberger case.

The Bate-Sulzberger case was made up in New York by counsel representing the American Bell Telephone, the General Electric and the Western Union Telegraph Companies on one side and the Westinghouse Company on the other.

The Supreme Court affirms all that was claimed by Shultzberger and settles forever what constitutes the life of an American patent. As to its effect, it first of all removes completely all proprietary rights to the patents covering the carbon or battery telephone transmitter. The Bell Company claimed this enunciator under the Berliner patent, which was decided against the company by Judge Carpenter in the lower United States Court in Boston several months ago. The Supreme Court decision and that of Judge Carpenter makes it possible for any one to use the carbon transmitter. The Bell Company still holds numerous small devices, but its fundamental grip is gone and now the way is clear for rivals.

Another great electrical patent which is destroyed is that issued to Edison in 1887, known as No. 369,280, covering a dynamo with translating devices in a multiple arc. Little has been said about it in the newspapers. It was a patent broad enough to cover every device for transforming electrical energy into mechanical energy. The company which holds it began suits under it in the winter of 1893-4 to enforce payment of royalties. The institution of the Bate-Sulzberger case caused those suits to be continued.

There are other minor patents involved. The capital which is interested runs possibly to $300,000,000. The decision affects not only the electrical industries, but throughout mechanical industries the effects of the decision are felt. The rubber industry is heavily involved and a number of others.

Recent Additions to the Collection of the State Mining Bureau.

Dumortierite from Ogilby, Cal.; selenite from Utah; aragonite from Arizona; arfvedsonite in microcline from Colorado; white and yellow topaz in matrix from Utah; albite and microcline from Amelia Courthouse, Virginia; celestite, fluorite and siderite from England; cerussite from Broken Hill, Australia, and from Bohemia; corundum, rutile and kyanite from North Carolina; epsomite from the New Almadeu mine, C. C. Derby; beryl from Siberia, J. Z. Davis; fluorite from New York, J. Z. Davis; pink crystals of apatite, J. Z. Davis; polished specimens of travertine, Verde antique and other marbles, A. L. Seager; gold quartz with telluride of gold from Siskiyou Co., Cal., B. S. Thomas; fossil fish from the foundation of the Courthouse at Los Angeles, T. Shooter; a number of new fossils from the Los Angeles and Puente oil districts and also numerous specimens of gold quartz, silver and other ores, rocks and minerals, etc. Henry S. Durden, Sec'y.

Colorado Mining Stocks.

Colorado Springs, Colo., March 2, 1895.

To the Editor:—Universal indifference towards every class of mining-stock speculation prevails with little evidence of any change. What little activity remains emanates either from some contemplated reorganization or various schemes to secure controls, etc., and possible professional speculation. There is no investment interests apparent.

It may appear ridiculous to pose as a bear at this time, although general opinion is that everything is cheap; but with very few exceptions, everything will probably be cheaper. One of the chief reasons for this is that mining-stock traders invariably represent the high-pressure class of business men, carrying more than their circumstances warrant and always being forced to realize at short notice, thereby creating many advantageous opportunities to invest.

If the Denver and local exchanges would co-operate and take pattern after the New York Stock Exchange and other institutions of the same class and insist that the stock books of the listed companies should be subject to the inspection of the stockholders at reasonable times, there would be more confidence, and ordinary speculators would receive at least a portion of the consideration they are unquestionably entitled to. Besides, there would be less likelihood of over-issues, exorbitant salaries and various other dishonest complications that are becoming altogether too frequent. A shareholder in a stock company is a partner in the concern, and there is no other way of defining his position.

I have in mind several well-known mining companies, the value of whose stock has recently depreciated very much. The books of these organizations are peculiarly difficult to inspect and reliable information an impossibility, and those supposed to have the reputation of conscientiously directing their affairs are particularly sensitive to comment of any nature whatever. This in itself shows that there is material for reform. If a few of the individuals connected with certain companies which have accomplished a great deal of questionable manipulation are to govern the entire mining stock market, the sooner the business is abandoned by those who desire to retain a respectable reputation the better.

There are undoubtedly many attractive purchases in the Cripple Creeks, but what recommends some of the silver propositions to the investor, few attempt to explain. One pleasing feature is that more attention is being given to legitimate mining than ever before, and the good results are daily increasing. Very respectfully, F. H. Pettingell.

The S. P. Co. has placed an order for forty-two locomotives with Eastern firms. The fact emphasizes the industrial condition of the city and State. This half-million-dollar-order would be a fine thing for a California establishment.

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Scientific Progress.

The Origin of Kerosene Oil.

Mr. John W. Rock, writing iu the *Australian Mining Standard*, says: The eminent French microscopists, MM. Bertraud and Renault, have by their researches settled the vexed question of the origiu of keroseue shale.

The writer is very sanguine and believes that these great Frenchmen have disposed of all the previous theories claimiug to establish for the prime cause, all kinds of organisms "ranging from forest tree to jelly fish."

It is allowed, however, that Professor David was right in the theory he set up, because it is in line with the deductions of Messrs. Bertraud and Renault.

Thc co-relation of the microscopic observations, according to Mr. Rock, lead to the conclusion that at the close of the carbouiferous period there existed in the now known oil regions "a series of shallow lakes fed by streams which carried sediment iu their waters and deposited it, in greater or less measure, on the bottom of the pools, mingled with innumerable leaves of the *gloss-opteris* (tree fern), which floated down with the current.

But the remarkable feature of this discovery of the origin of kerosene, traces it to the fecundating polleu of the prevailing plant family *Filices*, or feru family, that arc known not to shed their pollen from stamens like the phanerogamous order of plants but like true cryptogamia or non-flowering plants, for in the past, even much more so than now, they cast off their pollen as *spores* out of their spore-cases, called *sporangia*, and as the spores of the fern are not seeds, but fecundating germs, a fern plant is the second growth from the spore; therefore nature has made thc fern to produce in prodigious quantities the spores that seldom germinate, because, under the most favorable conditions of climate, few fiud a suitable matrix favorable to their biogenesis. We need not wonder then when we are told that this family of plants sometimes cast off spores sufficient to cover the floor of a forest to the depth of au inch in one year.

Mr. Rock next proceeds to say: "All around were forests of *coidaites*, from which, iu common with large areas of country, a ceaseless rain of pollen fell upon the surface of the lakes, each particle becoming macerated aud finally mingling with the mud at the bottom, forming the bitumiuous shales which exist in varying thickness below and above the kerosene bands."

He finds the coincident productions aud couditions necessary for nature to furnish her supply of kerosene to be:

1st. The presence of shallow lakes fed by the waters of numerous streams that traverse the neighboring forests.

2d. A hot damp climate, and large forests of tree ferus that throw off immense showers of pollen or sporangia.

3d. The waters of the stream must contain a peculiar vegetable matter called ulmic acid.

4th. The surface of the lakes must be covered with a miuute genus of algæ of rapid growth and ephemeral existence.

The writer further proceeds: "At the same time the waters became impreguated with a peculiar brownish vegetable matter, kuown as ulmic acid, such as is to-day found in the rivers Amazon and Orinoco in South America.

"Still the pollen from the forests fell upon the surface of the lakes and became water-logged, and sank to the bottom, mingling with the brown material that yielded the ulmic acid.

"But now a new phenomenon occurred. All over the surface there appeared a growth of minute plants of the genus of algæ, each consisting of a gelatinous, sac-like plant, floating free and containing many hundred cells. Each as it disappeared below the surface was replaced by another, to follow in its turn and descend slowly and gently to the bed of the lake, where rank on rank was deposited until, in some cases, 40,000 layers were piled up in a semi-fluid mass about twelve feet in thickness."

The mass then evidently dried up and the thickness mentioned above would shrink to about four feet six inches, forming one of our most valuable kerosene deposits.

Production of Ozone.

According to foreign chemical journals, the most recent method of producing ozone is that of Lieut. Poulsen, a Danish officer, aud is based upon the oxidatiou of phosphorus in a special apparatus. A wide-neck glass jar is closed with a fiuely perforated porcelaiu plate, and two iuches below this there is a similar plate inside the jar. Through the center of each passes a rod, which is curved upward at the lower end and terminates in a small cup for holdiug a piece of phosphorus. The jar contains sufficient acidulated water to submerge the phosphorus when the apparatus is not in uso, and, when ozone is required, a small quantity of potassium permanganate is added to this, and the phosphorus raised by means of the glass rod above the surface of the liquid. Phosphorus acid is formed by contact of the phosphorus with the air, and converted into phosphoric acid by the action of the permauganate, while ozone is produced simultaneously and escapes through the perforations in the porcelain plates.

Paper as an Insulator.

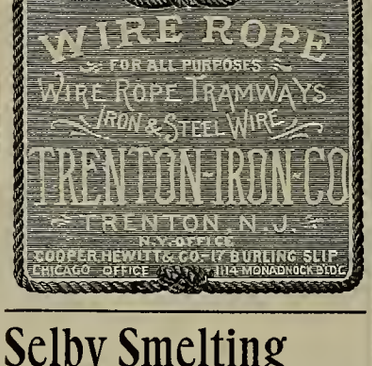
For mauy purposes paper is an excellent insulation, and has come into use in telephone and other cables. Such an insulation has beeu tried under water. One such cable is now at the bottom of the Hudson river at New York, in the track of all domestic and sea-bound traffic. The cable is lead-covered and otherwise protected, but depends for its insulation, electrically, on thin spirals of paper around each stranded interior wire. The laying of such a cable iu such a place might, a few years ago, have beeu considered little short of suicidal, but experience has demonstrated the practicability of the scheme. A 100-pair, paper-insulated, lead-covered cable can be bought for fifty cents a foot, while the rubber-insulated cable would probably cost not less than $3 per foot.

RECENT experiments show that glass is more porous than has been before thought. A vessel was partitioned into two parts by a light of glass, and on one side the vessel was filled with sodium amalgam and on the other with pure mercury. The whole was heated to a temperature of 200°, where glass begins to be very conductive. The two sides were then connected with the positive and negative wires of a battery and a current of electricity passed through for about thirty hours. At the end of this time it was found that quite considerable sodium had found its way through the glass into the mercury on the other side. Neither the original weight of the glass nor its transparency was in auy way changed.

THE Governmeut is testing a new plan for signaling at sea, which has already yielded remarkable results. It consists merely of an ordinary gong fastenod to the bow of the ship below the water line. This acts as a transmitter, and the receivers are gongs of exactly similar tone and rate of vibration, oue on each side of the ship below the water line. The receiving gong will take up and produce the sound of the sending goug from a long distance. Signals already have been clearly transmitted ten miles.

M. DEBOIS, of Reuleaux, France, has patented a new mixture, which, when burned, will withstand the highest temperatures. The mixture is composed of quartz or flint and sulphate of borium. The proportions are varied according to the needed resistance of the material, iu some cases, ground. Pudding stone is also added to the "mix." The moss, when moistened, will take any shape like ordinary fire clay, and is dried and burned in the same manner.

LORD KELVIN says that the earth might be white hot two thousand feet below the surface, or as cold as ice fifty feet below, without changing our present climate. He attributes the intensely hot climate of an earlier age to greater heat of the sun.



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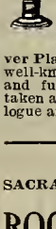

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Mechanical Progress.

A New Electric Locomotive.

A uuique electric locomotive is building at Boston, Mass. The distinctive feature of the invention is the substitution of a piston and cylinder instead of the usual rotary power. The cylinder is much longer than for steam purposes, and has in its interior a series of magnets. The piston passes entirely through the cylinder, with crossheads at either end. On the piston within the cylinder is a series of armatures of peculiar construction.

On the axle of the driving wheels are commutators, whose funetion is to apply and cut off the electric current, just as the eccentrics control the steam of the steam engine. The principle of the machine, which is of 8-H. P., is the admission of the current to the magnets in the cylinder, which are in advance of the piston rod, and hy their action on the armatures the piston rod is moved forward. As the stroke is ended, the current is shut off from the magnet first charged and applied to those at the rear of the piston, giving it a reverse motiou, thus maintaining a strong, regular motiou. There is absolutely no back pressure from the electric current, while iu a rotary motor this is estimated at tweuty per cent of the force applied.

It is practicable to run the machine at 200 revolutions of the axle per minute, and with a driving wheel eight and one-half feet in diameter, and the crank pin three feet from the center, there would be a six-foot stroke under a full head of power. The machine is adapted to receive the electric current either by a trolley wire, a third rail in the track, or from a storage battery.

How To Make an Engineer.

Speaking at a meeting of the Leeds Association of Engineers, on the 1st of Decemher, Mr. W. Clayton, M. Iust. C. E., who presided, said that we were told we were not to compete with foreign rivals, because Continental people had superior technical education. It was uothing of the kind. Continental nations were able to compete with us because they could supply at lower prices, and that, in turn, was because men worked longer hours for less money. Technical education was a good servant, but a had master, and conducted on the liues at present pursued in this country, would lead to nothing hut disaster. It was no use sending a lad for three years to a technical school, and then at nineteen or twenty years of age giving him a few months' experience in a workshop. To make a good engineer, the good old plan of apprenticeship must be adopted. Let a boy get used to his work, and then let him learn, what he could never do at a college, business habits. This was the only way to make an engineer, and no other way would be successful.—Scientific American.

In the great majority of cases it pays to do things the best you are capahle of, regardless of the expense of time and material required. The mechanic often meets with conditions under which he is tempted to "rush things" to a degree which forbids anything hut the shabbiest work. It may seem at the time that the circumstances justify it, but he generally finds afterwards, if he has yielded to the temptation, that palpahle loss resulted from his haste. The circumstances are rare which really recommend makeshift work. The mere fact that a man has underestimated the price of a piece of work, or the time in which it could be finished, is of itself no reason for sboddy execution —in nine cases out of ten.

Those who have traveled much by rail are more or less acquainted with the hot box. A hot box, as it is commonly called, really means a hot journal bearing on a hot journal, or both. It ariscs sometimes from the use of poor material in the bearing, sometimes on account of imperfect casting and sometimes from too great weight upon the bearing, producing friction and heat. There are now fewer hot boxes than formerly. Some of the heaviest cars are now carried upon six-wheeled trucks, thus distrihuting the weight of each end of the car upon six journal bearings instead of four, and reducing the danger of excessive friction. Better materials are used, and the workmanship upon them is better; weights to be carried are calculated more nicely and greater care is exercised in operation, so that the hot box is not what it once was. A man thoroughly familiar with railroading, who made, uot long ago, a trip of 10,000 miles, which included points as far apart as the City of Mexico, San Francisco and Chicago, said he did not encounter a hot box until he was within twenty miles of New York on his return.

Some engineers do not clearly understand why an engine is so wasteful of the heat units derived from coal comhustion. We are told by the scientists that only about six or eight per cent of the total heat value of coal is utilized in the engine by heating transformed into power. In tracing up this loss the engineer is told that it requires 1202° of heat or heat units (not degrees of temperature) to change one pound of water into steam. Duriug the absorption of this amount of heat the temperature of the water remains at 212°. This immense amount of steam is rendered latent, and does not sensibly affect the thermometer. The cause of the loss in the steam engine is then, that the 990° absorbed by water in being transformed into steam (212° are apparent upon a thermometer, which added to 990° make up the 1202° mentioned above) go into the engine unindicated by the thermometer and they leave in the same manner, and go to waste. This, then, is the main cause of the heat loss in steam engines.

In handling heavy machinery it is necessary to take every possible advantage. If three sticks of timher can he procured and set up at an angle, with the upper ends lashed tightly together, a support is thus formed for the hoisting tackle, with which almost any machine can he quickly unloaded from wagou or railroad car. Sometimes two sticks of timber are available when three cannot be had. The two may then be lashed together and erected, heing held in place hy two guy ropes. Sometimes even two sticks cannot be had and the work must he done with one. When reduced to the use of a single mast at least three, and better four, guy ropes are necessary. The guys may he quickly tightened by the use of a small rope tackle, and when once in place, machines can be easily handled by a heavy tackle suspended from the top of the mast.

The journal *La Metallurgie* describes a steam hammer patented during the past year, in which the hammer proper constitutes an air cylinder. In this cylinder moves a piston actuated by a crank, connecting rod and lever from the driving shaft of the machine; and the cylinder is pierced by holes, connected interiorly one with another and placed equidistant from its ends, allowing a free entrance and exit of air. By virtue of the movements of the piston and of the cylinder or hammer, which at certain instants are opposed, the holes are closed hy the piston and the air remaining below or above serves to give elasticity to the movements of the hammer.

When large boxes are filled with habbitt metal the lining is frequently found loose. This is caused by contraction of the metal during solidification. It is necessary to tighten such a lining hy hammering the entire surface of the soft metal. A hall peue hammer should he used, and the entire surface of the babbitt hammered over, after which the box should be bored out in the lathe to the required size.

Commodore Melville, U. S. N., expresses the opinion that not only speed but maximum economy in fuel will be attained through the use of the triple screw in steamships, each acting independently of the others, the center one alone being used for slow cruising. Other expert naval engineers concur in this opinion.

The trade winds are the prime motors of ocean currents. They cause a surface drift of no great velocity over vast areas of water in the same general direction as that in which they blow. These drifts, after meeting and combining their forces, eventually impinge on the land. They are diverted and concentrated and increased in speed. They either pour through passages between islauds, as in the Caribbean sea, or are pressed up by the land and escape hy the only outlet possible, as, for example, the Strait of Florida, and form a great ocean current like the Gulf Steram.

Engineers have figured out that Niagara would continue to pour for 100 years if the sources of supply of the Great Lakes should be dried up. Other engineers calculate that when the Chicago canal is finished and in operation, the water level in the lakes will be lowered nine inches—perhaps much more.

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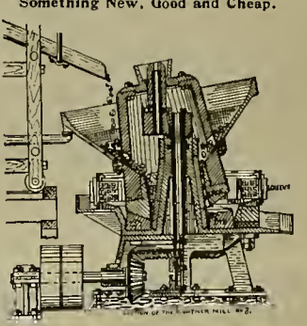

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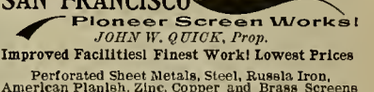

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220 Market St., S. F.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MINING ITEMS.

GOVER.—*Record:* Another change has taken place in the affairs of this mine. J. M. McDonald, at whose expense the mine has been kept free from water for the past five months, has withdrawn from the undertaking, and notified all parties concerned that he will no longer be responsible. An agreement has been entered into between the company and C. E. Purington, by the terms of which the latter is to take immediate charge of the Gover property, and, it is said, proceed to work it. He wishes to make arrangements with the creditors to enable him to work the property, and is expected to be up here shortly for that purpose.

ZEILA.—All the heavy work in the repairing of the mill is through with except placing the mortars and stamps in position. Two of the mortars were on the ground the first of the week, and another was expected Tuesday. The concentrator floor is being renewed. It is expected that another month will find the entire works—mill, mine and reduction plant—ready for entering upon another protracted era of gold production.

ZEILA CHLORINATION WORKS. — After the longest life probably on record for such works, the furnaces of the Zeila chlorination works are being rebuilt. The furnaces lasted fourteen years—in fact, ever since the resumption of work at the mine by the present company. For five years and fifteen days from the commencement of operations the fires were never extinguished, and at the expiration of this protracted period of service the floors only had to be renewed—not that they were actually worn out, but had become so uneven as to give the employes considerable trouble in scraping out the sulphurets. After repairs the works ran until the present time. The furnaces, notwithstanding the unparalleled record of longevity, were not completely worn out. It was not absolutely necessary to rebuild them. They would doubtless have done good service for years yet, with slight repairing. But inasmuch as a cessation for over a month was inevitable, and as the capacity of the old works was unequal to keeping pace with the product of the mine, it was deemed advisable to rebuild on a larger scale. The old furnaces were of three tons capacity, and somewhat overworked at that. The new furnaces will be of from 3½ to 4 tons capacity. With a practically new mill, it is expected that considerable more rock will be crushed per day by the forty stamps than of late years, and even with the increased size of the chlorination works, it is expected that enough sulphurets will be turned out to keep them steadily running to their fullest capacity. The extended life of the Zeila reduction plant is deserving of special note. Ex-State Mineralogist Irelan is reported to have stated that he believed the experience of the Zeila was without a parallel in any mining region on the globe. Mr. Detert, when the old works were first started, said he would make them last without repairs for five years, and this limit was exceeded by fifteen days. But a life of fourteen years without complete renewal would have been laughed at as utterly unattainable.

The five-stamp mill of the Smith Bros., on the Clough claim, came to a stoppage for a week owing to a break-down, which necessitated sending to San Francisco to replace the broken machinery. The mill is again running. No cleanup has yet been made.

Twenty stamps of the Keystone mine are running.

Another strike of rich ore is reported in the Mayflower mine. Rock heavily charged with free gold has been lately taken out.

Butte.

LOSS OF GOLD.—The loss of gold in quartz and other forms of mining is much greater than most people imagine. T. W. Reesce says that sixteen years ago at Cherokee an undercurrent was placed at the end of the tail race a mile and a quarter below the head of the flume. Twenty-four of these undercurrents were placed along the upper part of the big flume, and these were supposed to save every pennyweight of ore from the mine. This last undercurrent was put in simply as an experiment, but in six months when it was cleaned up, between six and seven hundred dollars were obtained.

Calaveras.

HAS NOT CLOSED DOWN.—*Echo:* The *Prospect* of last week had some grievous errors in regard to the Central Hill mine at Douglas Flat. That paper stated that the Debris Commissioners had ordered that operations be suspended at the mine. On the contrary, Messrs. Kidder and Huer, the Commissioners who inspected the property a couple of weeks ago, authorized the owners to begin hydraulicking when a restraining dam is constructed. The site selected for the dam is about 200 yards from the mouth of the tunnel. The dam will be ten feet high, but, of course, it will be added to from time to time as it fills up. It will be finished in a couple of weeks, when the Commissioners will again inspect it and determine whether it was built according to specifications. Meantime, the company is sluicing as usual.

A HYDRAULIC MINE CLOSED.—*Prospect:* Murphys seems to be out of luck, and now has received another black eye by the closing down of the Bisbee, McCormick & Thomas hydraulic mine at Central Hill. This mine, after the expenditure of thousands of dollars in running a tunnel to tap the mine, is forced to suspend operations just as the owners were about to realize some return for their expenditure. Though the debris from this mine is carried over land, and the right of way owned by the owners of the mine for many miles, before it reaches the upper course of the Stanislaus, which is not a navigable stream, all operations must be stopped for want of restraining dams. Hon. John F. Kidder and Major W. H. Huer, Debris Commissioners, went up Friday, and after visiting the ground ordered operations to cease. It is thought that dams can be built at small expense that will enable the mine to resume. Meanwhile the season for hydraulicking passes away and the owners must go down in their pockets for coin.

Del Norte.

THE USUAL CLAIM.—*Record:* We learn there are parties from Portland here who have a black-sand mining machine of their invention, which will be put up and thoroughly tested on the beach below town. The owners of this machine, like those in the past who have been here with devices of the same kind, claim that it will save all the gold in the sand without a doubt.

Nevada.

THE NORTH BLOOMFIELD MINE.—The ditch of the North Bloomfield gravel mine has been closed for over two months, with small prospects of getting it open again before early summer, owing to landslides and destruction of flumes by heavy snows. The company has had some "way water" for a short time, but a large landslide above Relief Hill has cut that off and effectually closed the ditch for some time to come. The company, it is said, will make no effort to open the ditch until the snow melts.

THE HARMONY MINES.—*Herald:* The Harmony mines have resumed operations. The mines have been suspended for several weeks, but will probably not be troubled any more this season.

ELECTRIC MINE.—The Electric mine, which has had some trouble with water the past winter, is gaining on this difficulty at present, says the *Telegraph*. There are still two levels submerged, but by freeing one of the levels recently an additional force of men has gone to work. Supt. Coffin states that there are now about thirty miners engaged at the Electric.

THE YUBA.—It is rumored that the Yuba mine, Maybert, will begin operations again soon. The Yuba is a good property, and if properly developed would make a paying mine again.

INCORPORATION ARTICLES FILED.—*Transcript:* Articles of incorporation of the Red Dog Mining Company were filed in the county clerk's office. Principal place of business, Nevada City. The object of the company is to purchase, locate, acquire and operate mining ground, and to lease, purchase and acquire water rights and ditches. Amount of capital stock, $30,000, at $1 a share. The following are the directors: John Spaulding, W. F. Englebright, J. S. Goodwin, Martin Lawrence, R. E. Linder and F. Goding, all of whom subscribe for 5000 shares each.

MINE BONDED.—*Telegraph:* Timothy Hurley and others have bonded the General Grant mine. The mine is located about half a mile southwest of Forest Springs and is owned by Martin Ford, John Tierney and Alfred Perrin. There are two tunnels on the mine; one of them is about 1000 feet in length. The ledge is fully eight inches in thickness and the ore yields $65 per ton. The last work done on this mine was in 1872, and during the active operation of the mine some $50,000 were extracted from the ledge. At a very early day suitable machinery will be placed on the claim.

RICH ORE.—At the Champion mine the rock is of extra good quality; many beautiful and valuable specimens are daily extracted. The mine is running at full blast, the entire thirty stamps being constantly in use.

GENERAL NOTES.—The Culverson mine at Graniteville, which has been shut down on account of the water ditch being blocked, has started up again.

The National resumes operation this week under the supervision of D. T. Powers. It will take about a month to pump the water out, after which the full crew will be put to work again.

The ten-stamp mill at the Erie mine will soon be remodeled and started crushing rock in about a month. The tunnel will tap the ledge at a depth of about 700 feet.

Plumas.

MINING ITEMS. — *National-Bulletin:* The Lucky S. mine will start work as soon as the weather will permit.

Joseph Gruss, superintendent of the Genessee mine, will shortly resume operations.

At Gopher Hill the Quincy Mining and Water Co. is ready for a big season's work. At the head of their extensive water system there is now probably fifteen feet of solid snow, capable of maintaining an effective water supply till late in the summer. The company will operate on a large scale.

Pitner Trayner, the superintendent of the Northern Placer, will return from below in a few days. As the snow is beginning to melt in the vicinity of the mine, the washing of the gravel will soon begin. The mine is fully equipped for active work.

At Mills' shaft the rain last week and the rapidly melting snows produced such a volume of water at the mine as to cause a suspension of work until there shall be less to contend with. It is probable that work will be resumed underground in a short time.

Much activity is expected at Granite basin during the coming summer, though operations cannot be resumed at a date as early as usual, on account of the heavy snowfall in that section during the past winter. Last fall that mining camp was visited by numerous mining men seeking investment or hunting for prospects to develop. Several locations and investments were made, and doubtless more will follow during the coming season. That country has numerous small and rich veins of quartz.

Placer.

THE GOLD RING.—*Sentinel:* The Gold Ring gravel drift mine at Green valley, three miles south of Dutch Flat, is at present doing better than at any time in its history. During the past month some fine nuggets, ranging from $4 to $16, have been found. Supt. Ames employs twenty-four men. There are a number of promising claims in Green valley.

THE BLACK HAWK.—The Black Hawk mine at Forest Hill, formerly the Kirk property, was bonded this week to J. P. Mallette, of Chicago, for $40,000. He is the recent purchaser of the Zantgraf mine for $150,000.

OPHIR DISTRICT.—The Boulder and Hathaway mines at Ophir bid fair to be dividend-paying mines. The Hathaway is owned by Colgate, the soap king. At the Boulder fourteen men are engaged in stoping, breasting out, and getting the mine in shape for working. A reservoir has been cut out off from the main drift, into which all the water (mostly surface) will be run.

THE GOLD BLOSSOM.—The Gold Blossom is at present at a standstill, until larger machinery is put in. The company now running it under bond claim that it will pay, and pay big, with larger machinery capacity. The ore is being worked by the Hopper drying process, and it is claimed that $8 rock will produce $30, but it takes too long to work a ton.

THE MARGUERITE.—At the Marguerite a six-horse power engine and pump are being erected, and in another week the working force will be increased to fifteen men.

Riverside.

PROGRESS AT PERRIS.—A year ago there were but two mills at work in the Perris district—one a diminutive five-stamp prospector's mill and the other an antiquated rotary, which for several years had been worked on the Good Hope. There was also a five-stamp mill lying idle on the Menifee mine at Menifee. Since then a twenty-stamp mill has been erected on the Good Hope, a ten-stamp on the Santa Rosa, a five-stamp on the Santa Fe and a five-stamp on the Alice mine. Besides these, mills have been put up on the Infidel and Briggs mines, and all are bringing in fair returns to their owners.

San Bernardino.

RICH GOLD STRIKE.—McHanly Bros. report locating a ledge in the Pinon district, sixty miles east of Banning, on the borders of Riverside and San Bernardino counties, which gave $915 gold from three tons worked at Tingman's mill.

San Diego.

Thomas Kaine has sold to Amanda J. Page for $400 the Bonanza quartz mine and the Golden Deposit placer claim in Mesquite mining district.

Sierra.

MINING ACTIVITY.—*Messenger:* Five stamps are running at the Wm. Tell mill, and the quartz is said to pay very well. Forty stamps are running at the Bonanza mine and fifty-five men are working there, many of whom are from Downieville. The Sierra Buttes miners have been clearing the company's large flume of snow to bring in water, and are now once more working in the mine. It is reported on good authority that the Bigelow ledge will be reopened this coming summer and operated on an extensive scale. Many men are unemployed, but will soon be busy again.

Siskiyou.

MINING NOTES.—A company from Oregon, Messrs. Fulton, Espy, Denio and Hunter, have bought from Quinue & Simmons forty acres of mining ground on Rocky Gulch, to be worked by hydraulic process. A 200-horse power pump is to be placed at Shasta river, and operated by water power in extending the electric light plant ditch 500 feet farther down the river for securing sufficient pressure upon a large wheel. The water from the river is to be forced through 1100 feet of pipe, to an elevation 400 feet above the river, then carried through a flume three-quarters of a mile to the diggings. The water will flow down into Yreka creek, and thence back to Shasta river again, nearly two miles above where it is taken out, and if extended to Greenhorn, across Yreka flats, would run back into the river just the same by reaching Yreka creek, of which Greenhorn is a tributary. The cost will approximate $25,000. It will take about $15,000 more to place it in working order, by using a wheel, pump, building flume, etc. It is expected everything will be in readiness to commence taking out gold in about ninety days. The claim is two miles north of Yreka.

The hydraulic mines at Oro Fino are being worked; there is an abundance of water to keep the giants well supplied for continuous piping. The water supply, owing to the great quantity of snow on the mountains, will last until very late in the season, giving assurance of the greatest yield of gold ever realized in that rich mining camp.

At Little Humbug and Horse Creek, on the Klamath river, above and below Oak Bar, the miners are at work in their placer claims.

The miners at Indian Creek are commencing to get ready for mining, now that the snow is melting rapidly to furnish plenty of water.

The Red Hill hydraulic mine, in Black Bear district, Salmon river, is being worked on an extensive scale. A large yield of gold is anticipated this season.

The mining companies at Cottonwood are making preparations for extensive operations. Jillson & Co. and the Black Jack Co. will start their new quartz mills in a few days, to crush the blue gravel cement from their claims, which prospect very rich.

Tuolumne.

THE LADY WASHINGTON MINE.—This mine adjoins the Eureka and Dead Horse mines to the north, and is located on the west side of the mountain slope, that rises from the north fork of the Tuolumne river 2500 feet to apex. It is further situated in the Summersville mining district. A very rich strike of unusual importance has just taken place in the above mine which demands more than a passing or casual notice from the fact that this particular vein has heretofore escaped the observation of the past owners of the mine. The Messrs. Rule and Doe have, during the last few months, spent considerable money prospecting and developing the property. Their work was confined to the east vein principally but about three weeks ago. The Messrs. Rule made a careful examination of the surface surroundings to try and find another vein that was known to exist, and known as the west vein, being on the true footwall, and is granite. The hanging is slate, hence a contact vein. Having thoroughly explored the mountain side, they were rewarded by finding some croppings and a sign of a footwall. Determined to enter a tunnel at that site, which is 200 feet below any of the works on the east vein, they quickly struck quartz. The tunnel is now entered 18 feet, disclosing a 12-foot solid lode which shows free gold disseminated through the whole mass from wall to wall. The gold is fine, but in such quantities that is easily visible to the naked eye. This rock will mill, on a most conservative estimate, $100 per ton. They have already passed through several feet of this rich ore body. The rock in the breast is of the same bonanza character. To what distance this shoot will run is only a matter of conjecture. From the floor of this tunnel to apex of lode gives 1100 feet of backs, or from their lowest tunnel level will give 2300 feet. Hence it will be seen that this rich find is of the greatest importance. This development actually makes a new mine of the Lady Washington. This discovery has infused untold encouragement to all the mines in the vicinity. Prospecting in every direction is the result of the impetus given by this new find. I am pleased to be able to state that the Seminole group of mines are looking exceedingly well. Their present mill of ten stamps is pounding away day and night on good ore. This company proposes, in the near future, to erect another mill of twenty or more stamps at their low tunnel level on the north fork of the Tuolumne river, which will be a crosscut to open up and develop the whole group at a great depth. This step is a wise one, as it will enable the management to work this ore most economically. This group of mines lie to the southwest of the Lady Washington, Eureka and Dead Horse veins, but not on the same lode, but may be found of equal value when developed. From the present outlook that fact seems to be assured.

ALASKA.

JUNEAU TO FORTY MILE.—There are sixteen to eighteen saloons at Juneau and about the same number at Douglas City, one mile away, across the channel. There are about 1500 people at Juneau and about 750 at Douglas, and 400 or 500 men out of employment. After reaching Juneau it requires between $200 and $300 to get to Forty Mile, which is about 800 miles northeast, with bad mountain roads, rapid streams and portages to overcome on the way. The placer mines are about as far from Juneau as Billings, Montana, is from Seattle. Town lots at Juneau and Douglas are held at high figures.

ARIZONA.

ANOTHER MINING DEAL.—*Herald:* One of the most considerable mining deals ever consummated in this place was brought to a close yesterday when Major W. A. Rowe sold to H. J. Sisty and W. A. Clark, of Colorado Springs, the celebrated Shelton group of gold mines situated on Lynx creek, fifteen miles from Prescott. The purchasers are well known in mining circles, having, not a great while ago, sold the King Darrow mine in Cripple Creek district. They propose to commence work on an extensive scale, and will erect a new twenty-stamp mill on the Shelton properties. The group consists of thirteen claims, five of which are the personal property of Major Rowe, who regards Lynx creek as the coming gold-producing section of Arizona. A year ago when he commenced work there he says not a blast could be heard going off. Now one mill is running steadily, another is about to start up, and the twenty-stamp mill for the Shelton group will make the third. While the purchase price is not given, the reporter was assured that "it is one of the biggest deals for years." An excursion party of Colorado capitalists, who are also in the deal, will soon visit this section and the mines.

THE MAMMOTH.—The Mammoth mill is in constant operation. About sixty-five men are employed. Fifty stamps are crushing ore from the Collins group.

THE DEL PASCO.—*Courier:* In the Del Pasco mine, at a depth of 400 feet in the 700-foot crosscut tunnel, four inches of solid metal has been struck, in contact between porphyry and slate. There is two feet of ledge matter in the drift to the north. The mine is now worked by J. A. York and Wm. Vanderhilt. It is a famous property, which has produced $2,000,000 in gold. Lester Jackson at one time leased it to Gohin & Robbins, and they took from it in six months $40,000.

BRITISH COLUMBIA.

CONCENTRATOR WORKING.—The concentrator of the Slocan Milling Company below Three Forks is running. In the experimental run 500 tons of Alamo ore was put through, yielding 200 tons of concentrates, averaging 160 ounces silver and 72 per cent lead. In less than a year, since Captain N. W. Moore, who is at the head of all the Duluth syndicates operating here, they have acquired title to over $500,000 worth of mining property, consisting in part of the Ivanhoe and Elgin, the Idaho mines (of which George W. Hughes owns one-third), the Alamo and St. John, and

last, the Cumberland. Outside of this is the new concentrator of 100 tons daily capacity, which cost, for superstructure, machinery, etc., $30,000.

The reopening of the Comiquo at Kaslo has taken the rounder element from Three Forks and left the town much quieter. All winter long there has been so much hustle and rush here that the busy Three Forker spelled the name of his town "3 4x," but now the mercantile and hotel man has more time at his disposal.

IDAHO.

IDAHO MINES BONDED.—The Aspen and Mammoth gold mines, near the Yellow Jacket mines in Lemhi county, owned by D. M. Steen, Col. N. J. Sharp and A. J. Pierce, have been bonded to W. H. Savidge and J. M. Clark, representing New York capitalists, for $20,000, payable in quarterly installments of $5000 each after July 15th. The ore averages $15 per ton. The owners will put a force of men at work and it is expected in a few weeks the mines will be in full operation. Within two miles of the property two 10-stamp mills are located, where the quartz will be milled for the present. It is the intention to build a stamp mill with modern improvements.

A copper mine on Lost river, in Custer county, has been bonded to Loudon and New York capitalists, by Colonel N. J. Sharp, A. J. Pierce, R. M. Davidson and A. B. Reed, for $75,000. A forty-ton smelter will be erected. For the present the ore will be treated in the Houston smeltor near the property. The mine is said to be one of the best copper propositions in the State. It is estimated that there are at least 15,000 tons of ore in sight.

THE TIP-TOP PROPERTY.—*Idaho Nugget*: Col. Bryan is again back in Silver City and the Tip-Top mine is now being examined by experts in the interest of San Francisco parties with whom a deal is pending for the organization of a stock company, which will probably take charge of the property. In the bottom of the shaft the miners are now encountering ore quite different from that found nearer the surface. The ore is extremely rich in silver, similar in character to the silver-leads in the DeLamar mines. Specimens are being shown in Silver City which run up to several thousand ounces in value. These are not small specimens, but great masses. This rich ore having been encountered since the arrival of the experts, leaves but little doubt as to the nature of the report made on this famous property.

MONTANA.

RICH STRIKE REPORTED.—The *Tribune* says: Thomas Carmin, of Pony, Madison county, reports that he has struck a ten-inch vein of gold ore which runs $400 to the ton in the White Pine Lead.

Thomas Reynolds and other New York men have put up a large capital to control the Somerset Mining and Milling Company groups of properties on the Spanish Peaks in Huerfano county, and will work them extensively. The negotiations were made by Col. John T. Doweese, and the bond is for $300,000. Money for the work is up and the purchasers mean business. Work is to be commenced March 1st on a tunnel to be driven to great length on Wahatoyn ground and cut a number of veins which show good ore at the surface.

NEVADA.

SILVER STAR.—There are about 125 men at work at the Silver Star, and cabins are going up on the hillsides. The Hardscrabble has two shafts about 150 feet deep, and claims to have 4000 tons of $100 ore in sight. There will be a great deal of prospect work done there when the snow melts.

OREGON.

Josephine Co.

ALTHOUSE DISTRICT.—The Griffin ledge of quartz lies on the ridge between Althouse and Sucker creeks, three miles from Browntown, and is being put in position to grind its ore by a ten-stamp mill. A wagon-road on Democrat gulch will be built this year at a cost of $3000, and the distance covered will be about eighteen miles.

SOUTH DAKOTA.

THREE HUNDRED OUNCES.—Deadwood *Pioneer*: The cleanup at the Holy Terror, which was made Wednesday, netted 300 ounces of gold. This was only five days' run with five stamps and is a very successful one. The streak of ore from which this run was made still continues in the shaft and the amount of the find cannot be estimated as yet. Stoping will commence as soon as the 100-foot station is completed. Keystone people are feeling very good about the result of the cleanup, and a good camp is an assured fact.

UTAH.

INTERESTING MINING STATISTICS.—*Tribune*: The statistics now being collected and compiled under the direction of Colonel George B. Squires, chief of the Salt Lake County Bureau, will contain an interesting and important feature concerning the mining industry and the amount of money that has been invested without return. The opinion prevails among the Eastern goldites that the mountains of the West are solid silver, and that it costs comparatively nothing to produce the white metal. Colonel Squire's statistics will show the amounts that have been spent in developing mines in the West Mountain district, and the totals are astonishing. For instance, on one group $250,000 has been expended in development work, and on another $150,000, and this on properties that have not been producers.

THE MERCUR.—At the Mercur Gold Mining and Milling Company two shipments have been made. Between 125 and 150 tons of ore are now being treated by the mill, which takes everything as it comes from the mines, there being no waste dump. Assays of the tailings from the plant show that the values are being saved in the tanks and the general operation of the machinery is extremely satisfactory.

THE MAMMOTH.—Official returns received from the first carload of ore taken from the ore bodies recently uncovered on the 1000-foot and other lower levels of the Mammoth mine show that the strikes just made are fully as important as the famous one on the 800-foot level, out of which the company paid the greater portion of its dividends. They give an average of 30.6 ounces in gold, 3.66 ounces in silver and a slight percentage in copper and lead. The tests having been made by three local assayers Saturday on a lot of nineteen tons of ore, which was sold to the valley smelters during the afternoon. It is understood that regular shipments of this class of ore are to be made as long as the new deposits hold out. The value of this carload was $12,366.

THE GOLD MOUNTAIN.—The Gold Mountain mining district is to be equipped with its first cyanide plant soon, the recent tests of the ores from the properties of the Deseret Mining and Milling Company having shown conclusively that the chemicals will take care of the values, and the treatment by the cyanide process result in the saving of practically all of the gold in the ores. Average assays from the ore bodies recently opened up in the Silver King give returns of $35 in gold and a healthy showing of silver, for which metal the property and the others of the group were formerly worked.

NEW COTTONWOOD COMPANY.—*Tribune*: The Gold Point Mining & Milling Company with a capital stock of $1,500,000, divided into 150,000 shares of the par value of $10 each, has filed articles of incorporation. The incorporators consist of I. N. Parker, A. E. Short, J. L. May, H. T. Duke, W. B. Short, L. P. Palmor, C. A. Short and James Y. Smith, each of whom have subscribed for 15,000 shares, and all of whom constitute the board of directors. Harry T. Duke is president; I. N. Parker, vice-president; L. B. Palmer, secretary, and C. A. Short, treasurer. The property of the consists of the Gold Point, North Bend, Wonder, Standard and Gold Dust, situated between Big and Little Cottonwood canyons.

Twenty feet of work upon a tunnel is said to have disclosed three feet of gold-bearing quartz lying between the trachyte and granite, which shows from $15 to $50 gold. Secretary Palmer states that the ore shows very marked improvement as proceeded upon, and that the development of the property will be upon a most energetic scale.

WASHINGTON.

AT EVERETT.—A refinery and shot tower are contemplated at Everett. The concentrator at Monte Cristo will be started as soon as the hetter machinory can be put in. Two large contracts have been let for tunneling and development work in the Pride of the Mountains and Mystery mines, 208 men being employed. More machinery is being added to the concentrator because it was not big enough to take care of the ore coming from the mines and to keep a sufficient supply ahead for the Everett smelter. President McBride of the Monte Cristo Mining Company says that the concentrator will ship five times as much ore to the smelter in the future as it has in the past.

WYOMING.

A BIG ENTERPRISE.—J. B. Adams has completed the sale of placer gold mining claims below Boggs to New York and Rhode Island capitalists, and the money is being paid at present, says the Cheyenne *Sun*. This is a great enterprise, as over forty miles of ditch may be constructed, costing about $150,000. H. B. Gillespie, who has other property in the same locality, says he has secured the necessary funds to build the Slater and Elk Head ditches, which it is estimated will cost $250,000.

Chapman Hand Drill.

Realizing the extensive sale a first-class hand drill would have and the demand there was for a machine of this character that would give satisfaction, Mr. T. W. Chapman, formerly of Denver, went to work in a systematic manner to construct a drill which would be light enough for one man to handle and at the same time be compact and strong. By a series of experiments and a number of years experience with mining machinery, Mr. Chapman has at last secured what he considers the most perfect hand drill ever invented, comprising both simplicity and efficiency. The machine works upon a tripod with the "plunger movement," and the drill is withdrawn from the breast of the hole about two and one-quarter inches after each stroke and then turns partly around just before the next blow is given. The force of the blow can be regulated from sixty to one hundred and fifty pounds, and it is claimed one man with this machine can do more work than three men can do by hand. The Chapman Drill and Machine Co., of Chicago, Ill., are now putting this drill upon the market. *

THE Russian courts have reversed the assumption of the American tribunals that when a husband and wife are drowned in the same disaster the wife dies first. The Russian doctors have testified unanimously that the man would be the first to die, because the woman is more agile and keeps herself longer above water.

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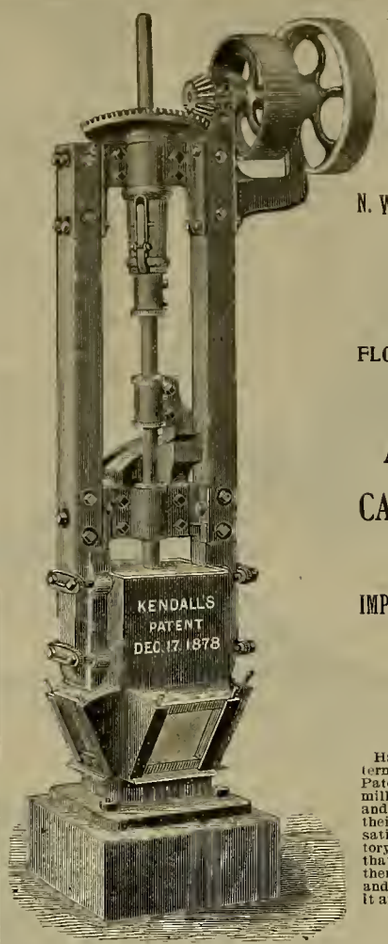

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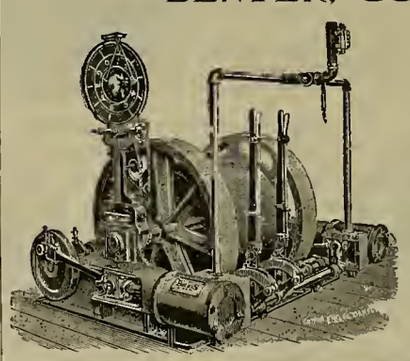

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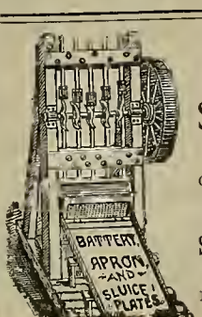

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Electrical Progress.

Electricity appears in "full dress" array this week in honor of the National Electric Light Convention at Cleveland, Ohio. The issue is a work of art and highly creditable to the profession.

MOTORMEN on the Mission street line commend the glass front cars built by Hammoud & Co. of this city. As compared to the open cars they are said to be a great protection to the health of motormen.

IT is said that the Market Street Railway Company contemplate an enlargement of their power-house to three times the present capacity at an early date. This company's lines will soon be entirely electric except on the high-grade routes.

THE Selby Smelting and Lead Company are making a special grade of lead plates for storage-battery purposes. The demand for these goods is said to be gradually increasing, and they are receiving a number of inquiries from different parts of the coast concerning the same.

THE question of underground conduits for electric railway trolley wires is again brought up in a lengthy article in a recent issue of the *Chronicle*. In this climate, and with more than half of the routes already conduited for cables, this should not prove a difficult task to successfully accomplish.

THE holders of the franchise for the new electric street railway in Berkeley intend to commence work at once. A system of transfers will be used in connection with the Grove street and Telegraph Avenue lines, which will practically provide transportation to all parts of Oakland.

THE *Electrical Review*, published at "13 Park Row, New York, was 13 years old last week, February 13th." Here's a trio of thirteens that's sure to continue good luck for the *Electrical Review*. Long life, continued success and prosperity to you. May your light continue to shine up to full standard.

THE unit used in measuring the strength of electric currents was first called "an ampere" by the French Electric Congress of 1881, the name being given to it in honor of Andre Marie Ampere, the French scientist, who elucidated the theory that the magnetism of the earth is the result of electric currents circulating around it from east to west.

ONE of the most interesting features of the N. E. L. A. Convention, held at Cleveland last week, was an informal address by Mr. Charles F. Bush, the well known pioneer in high-tension currents for light and power purposes. To those present who were familiar with the obstacles which Mr. Bush had to overcome before achieving his brilliant success this address must have proven of more than passing interest.

MESSRS. WHYTE AND DE ROME, the bronze and brass founders of this city, are doing a large amount of casting for the various electrical companies and electric railways. They are having a special demand at this time for their bronze castings. This firm manufactured the castings for the famous Lick historical statuary recently erected at the City Hall plaza. Their electrical sales agents are Messrs. Reager and Atwater of No. 214 Pine street.

THE Eureka Electric Company of this city are making a special feature of their new electric hand lamp. This lamp consists of a two-candle power lamp and a storage battery of about the size of an ordinary dark lantern, having a capacity of from four to five ampere hours. The lamp is lighted by the compression of a spring circuit-closer operated by the thumb, and the whole makes a neat and convenient apparatus. Primary batteries are provided for re-charging the cell when exhausted.

DURING the Electrical Congress held at the Chicago Expositiou a committee was appointed to consider the establishment of a system of units of electrical measuremeut, and the work, in the main, was left with the celebrated German physicist, Helmholtz. The death of this savant delayed the conclusion of the work. Not until the last week have the standards been agreed upon. Now the matter is in the hands of Prof. O. C. Marsh, of Yale, and he will forward his report to Washington.

R. DUNSMUIR & SONS, coal dealers of this city, are now operating their coal docks entirely by electricity, with the single exception of a hoist for screenings, which is required at all hours. The plant consists of two 90 K. W. generators; two locomotives of 15 H. P. each; and three coal hoists of 80 H. P. each. The combined capacity of the hoists is more than 1000 tons of coal per day. The electrical plant was provided by the General Electric Company and the steam power by H. P. Gregory & Co. of this city.

THE substitute for the ordinary forge, as proposed by George D. Burton of Boston, consists of a method of heating by plunging the metal into a vessel of water and passing a strong current of electricity through it, the apparatus comprising a wooden bucket containing a large sheet of lead, which forms the positive pole, and an iron bar laid across the bucket, forming the negative pole. The metal to be heated is held in the tongs, which are rested on this iron cross-piece and dipped into the liquid as desired, thus avoiding all flexible connections with the tongs. Two ordinary nails held in the tongs and dipped in the liquid are found to be heated to a welding heat in a few seconds, so as afterward to be welded on an anvil with a few blows of the hammer, or they may be welded by simply allowing them to fuse together. The solution which has been found best adapted to this purpose is a solution of ten parts carbonate of soda and one of borax dissolved in water until the specific gravity at 70° is 1.150.

EXCELLENT REPORTS of development and continuous working are received from the old Empire mine in Gold valley, Sierra county, California. The mine was bought last summer by the Gold Valley Mining Company, consisting of local and English capitalists. A thirty-stamp mill, hoisting works, etc., and a 150 h. p. electric plant were ordered in August. Snow began to fall early in November and very much interfered with the hauling of machinery and supplies. But by January 1st, notwithstanding the snow was ten feet deep, the electric plant was completed and started up operating the hoist and large air compressor. Ever since starting, the machinery has been in constant operation without a single stoppage of any kind. The electric machinery is said to be the finest ever erected on the coast, and was built specially for this work by the Electrical Engineering Company of 34 and 36 Main street, San Francisco. We are pleased to note the great amount of electric work the Engineering Company has done in mining apparatus on the coast and the unqualified success it has had in each instance. The company has in its employ first-class electrical and mining engineers, and, with its increased shop facilities, has a capacity for a large output on short notice.

THE *Practical Engineer*, in an editorial on economy of electricity in the scattered distribution of power, makes the statement that in using electricity as a means of conveying power, regard must always be had to the nature of the power it is to replace. We are all familiar with shops of one sort and another in which from one or two sets of boilers there are steam pipes carried long distances and individual machines driven each by its own small engine. Now it is not simply that small engines in themselves are so very wasteful; they rarely have the chance of showing what they can do with good dry steam and they are rarely indicated to show what amount of fuel they are really consuming. It is, however, to the use in them of steam cooled by exposure in long lengths of pipe that a large proportion of their inefficiency is due. They are employed because steam pipes can be run easier than shafting, and, once fixed, require no attention, whereas a shaft calls for continual attention in oiling and maintenance. As between a high-class steam engine and short, well protected pipes, and an electric motor taking current from a distant dynamo, it is held that no one would doubt the superiority of the engine. But when the superior engine drives a dynamo, and current is led off to motors at a distance, there is no question but that this is superior to the use of small steam engines.—Electricity.

Electric Portable Fire Engine.

There can be little question that an electric portable fire engine would be efficient and thoroughly practical were the question of current supply settled, and were it not that this part of the outfit, if properly installed and used for its special purpose only, would necessitate so great an outlay of money. But it is not absolutely necessary that a separate plant should be installed for the electric engine system. Where a city or district is well supplied with electric lighting, railway or power mains, distributed fairly well, and all of the same nature and voltage, these could be used for current supply by connecting them at intervals with suitable taps or switch boxes, which would be easily accessible, and to which the engine motor could be connected. It would not be necessary to have these switch boxes very close to the water plugs; they could be some distance away, and the cable, carried by the engine, would be attached to the nearest one. The electric supply mains and switch plugs or boxes would thus have to be only in the principal streets and avenues. The engine could be connected to any water plug without any regard to the location of the connection boxes, as enough flexible cable could always be carried on the engine to permit operating the engines at quite some distance from the distributing mains.—Cassier's Magazine.

Electrical Transmission of Water Power.

The utilization of water power electrically transmitted for mine operation is becoming more popular among mining men, as each installation demonstrates not only the feasibility of the system but also the economy which every such installation shows when compared with pre-existing systems which it displaces or which are in similar operation elsewhere.

A notable water power will shortly be utilized by the Ontario Silver Mining Co., of Park City, Utah. This company has recently completed a drain tunnel, said to be one of the greatest and most expensive undertakings ever carried out by a mining company, not even excepting the Sutro tunnel. It is three miles long and is now discharging from its mouth nearly 1000 cubic feet of water per minute. This water, under a head of 120 feet, will shortly be driving large low-frequency alternating current generators for power and light—the three-phase system of the General Electric Company being employed. The three-phase current generated from these machines will be transmitted round the mountain to the Ontario and Daly mines, five and a half miles from the generating station, and be used to drive the mills and to light the surrounding buildings. A portion of the current will also be taken to furnish light to the neighboring town of Park City. The voltage of the transmitted current is 2500 volts.

At Silverton, Colorado, the motive power is also derived from a distant water course. Three miles away a special double-nozzle Peltou wheel, four feet in diameter, running at 225 revolutions per minute under a head of 180 feet, has been installed. This drives a 150 kilowatt 2300 volt General Electric three-phase generator. The greater part of the current is taken to a 125-horse power induction motor, which operates the mill, and which, wound for 2000 volts, is used without transformers. The balance of the current is utilized at the mines for the operation of arc and incandescent lamps, and the driving of smaller motors operating pumps, ventilators, etc., the pressure of the secondary current for these motors being reduced, by step-down transformers, down to 220 volts. This plant is a model three-phase transmissiou, and in its operation since its installation has proven both economical and fully satisfactory.

AT the last meeting of the Technical Society Mr. Medina, of the Postal Telegraph Co., delivered a very interesting address on the "Transmission of Intelligence by Electricity," among other things lucidly explaining the theory and workings of the quadruplex.

DELINQUENT SALE NOTICE.

DUMBARTON LAND AND IMPROVEMENT COMPANY.—Location of principal place of business, San Francisco, California; location of works, in the counties of Alameda and Santa Clara, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 7) levied on the 22d day of January, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Name	No. Certificate.	No. Shares.	Amt.
Charles L. Beuton	567	200	$25 00
Charles L. Benton	569	100	12 50
Mrs. Ellen Dwyer	124	100	12 50
Edward Fox	524	400	50 00
Mrs. Elma Glover	413	60	7 50
Jabez Howes, Trustee	450	1,200	150 00
Jabez Howes, Trustee	487	667	83 38
Jabez Howes, Trustee	494	500	62 50
Jabez Howes, Trustee	495	500	62 50
Jabez Howes, Trustee	512	50	6 25
Jabez Howes, Trustee	533	125	15 62
Jabez Howes, Trustee	580	175	21 88
Patrick Holland	137	50	6 25
D. E. Hayes	156	40	5 00
D. E. Hayes	499	1,000	125 00
D. B. Hinckley	497	1,000	125 00
A. Kappenman	248	400	50 00
Mrs. Annie A. Pritchard	430	50	6 25
Mrs. Annie A. Pritchard	422	100	12 50
H. W. Quitzow	129	100	12 50
H. W. Quitzow	130	100	12 50
H. W. Quitzow	131	100	12 50
H. W. Quitzow	132	25	3 12
H. W. Quitzow	133	25	3 13
H. W. Quitzow	134	25	3 12
H. W. Quitzow	135	50	6 25
Mrs. Catherine Rimington	216	20	2 50
James Spiers	498	1,000	125 00
Mrs. Fannie L. Waller	140	50	6 25
E. L. Wagner	227	1,000	125 00
L. P. F. Waller	525	220	27 50
L. P. F. Waller	530	100	12 50

And in accordance with law, and an order of the Board of Directors, made on the 22d day of January, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the Company, No. 214 Pine street, on THURSDAY, the 21st day of March, 1895, at the hour of 2 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

JABEZ HOWES, Secretary.

Office—214 Pine street, Room No. 5, San Francisco, California.

NOTICE OF POSTPONEMENT.

In accordance with an order of the Board of Directors of the Dumbarton Land and Improvement Company, adopted at a regular meeting, held on the 26th day of February, 1895, the day of sale for unpaid Assessment No. 7 is postponed to THURSDAY, March 28th, 1895, at 2 P. M.

JABEZ HOWES, Secretary.

Office—214 Pine street, Room 55, San Francisco, California.

DELINQUENT SALE NOTICE.

REED MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Ferguson Mining District, Helene, Lincoln county, Nevada.

NOTICE.—There are delinquent upon the following described stock, on account of assessment No. 1, levied on the 31st day of December, 1894, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amt.
J. H. Isham, Trustee	6	500	$10 00
J. H. Isham, Trustee	7	2,500	50 00
J. H. Isham, Trustee	8	50	1 00
J. H. Isham, Trustee	9	50	1 00
J. H. Isham, Trustee	14	33,400	668 00
J. H. Isham, Trustee	13	73,000	1,460 00
J. H. Isham, Trustee	18	75,000	1,500 00
Geo. G. Reed	15	12,857	257 14
Geo. G. Reed	17	2,143	42 86

And in accordance with law, and an order of the Board of Directors, made on the 31st day of December, 1894, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 33, Tenth Floor, Mills Building, San Francisco, California, on WEDNESDAY, the third (3d) day of April, 1895, at the hour of 11 o'clock A. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of the sale.

J. H. ISHAM, Secretary.

Office—Room 33, Tenth Floor, Mills Building, San Francisco, California.

BACK FILES of the MINING AND SCIENTIFIC PRESS (unbound) can be had for $3 per volume of six months. Per year (two volumes), $5. Inserted in Dewey's patent binder, 50 cents additional per volume.

What a Man's Life is Worth.

Decisions in two damage suits against the Ann Arbor railway for the deaths of William Beaulien and George Alberts, employes of the road, were rendered at Toledo, Ohio, last week, by Judge Ricks. They are of unusual importance because of determining the maximum sum to be recovered in federal courts in cases of this kind. Judge Ricks said: "One of the most difficult questions for a court to determine is for a correct and just measure for damages in a case of this kind. It is hard to say that a human life is not worth such a sum as the master has given in this cause, because the records show these men were of excellent habits, fond and affectionate husbands and in every way a help and comfort to their families and useful to the public. In a large number of States where the limit for the loss of life has been fixed by the Legislature, the sum of $10,000 has been fixed as the maximum allowance to be made. This is a legislative construction of a fair maximum sum to be awarded in such case. I think the court may properly, therefore, accept this concordant judgment of so many different State Legislatures as justifying it in saying that the maximum ought not in any one of these cases to exceed that sum."

A new launch ("Satellite") is now in the Union Gas Engine Co.'s works being fitted with motive power. The motor is a twelve H. P. marine gas engine of new pattern, low and compact. The reverse gear is also a new design, and built expressly for the purpose. She will use a thirty-inch four-blade propeller, and is expected to attain a speed of ten or twelve knots in good water. The boat was designed and built in Seattle, and her model is said to be upon finer lines than any launch heretofore designed on the coast. The hull is of oak and cedar, staunchly built in every way. The dimensions are 35 feet 6 inches in length and 6 feet 8 inches beam, and she will draw, when loaded, about fourteen inches forward and three feet aft. Her cabin is twenty-three feet in length, divided into three compartments, all enclosed by large plate-glass panels. The interior of the cabin is handsomely finished in curled maple and ash, and is provided with every modern convenience that ingenuity can devise to assure the comfort of half a dozen passengers, including a fifty candle power searchlight and incandescent lamps fed from storage batteries concealed in lockers. The "Satellite," when complete, will cost about $2500. The owner—Dr. V. P. Buckley—will use her as a pleasure craft on the bay of San Francisco. She will be launched about the 1st of April.

The requisites of protective painting for structural iron work have been made the subject of careful investigation by Mr. Wallis, of the Association of Engineers, Virginia, and the results of his studies in this direction have now been published. He recommends, as essential, that the first coat be of red lead grouud in raw linseed oil, and used within two or three weeks after mixing, being also kept thoroughly mixed while in use, this coat drying in from twenty-four to thirty hours. If the finish is to be black the uext two coats should be made up from a paste composed of sixty-five per ceut of pigment and thirty-five per cent of raw oil, the pigment to consist of sixty-five per cent of sulphate of lime, thirty per cent of lampblack, and five per cent of red lead as a drier, the whole being thinned to a proper consistency with pure boiled oil. If the finish is to be of red or brown the paste should be composed of seventy-five per cent of pigment and twenty-five per ceut of pure raw oil, the pigment to consist of fifty-five per cent of sulphate of lime, forty per cent of oxide of iron, free from sulphur and caustic substances, aud five per cent of carbonate of lime as a drier, the sulphate of lime to be fully hydrated. The estimated cost of such paint, ready for use, is about sixty cents per gallon.

An English court has decided regarding property rights in photographic portraits, that the copyright belongs to the sitters when they order the portrait and pay for its being taken. The only claim for copyright by the photographer is when he invites sitters to have their likeness takeu, and when they assent to sit without payment, doing so for purposes of publicity or advertisement.

"There is no use of walking the floor with a felon," says a gentleman who has had some experience in that direction. "Wrap a cloth loosely around the felon, leaving the end open. Pour gunpowder in the end and shake it down until the felon is covered, then keep it wet with camphor. In two hours the pain will be relieved, and a perfect cure will be sure to follow."

Dr. Pashkiff, of Russia, advocates the dressing of recently received wounds with a thin layer of ashes prepared by incinerating some cotton stuff or linen. The blood mingles with the ashes and forms a protecting surface, uuder which the lesion heals rapidly.

San Francisco spent nearly $40,000,000 for imported merchandise in '94. One-third of that sum could be kept at home under improved and legitimate industrial conditions.

Greenwich records show that for fourteen years there has been an average of but twenty hours of sunshine in London in December.

Power, Mining, Milling, Smelting, Concentration and Leaching Machinery; Return Tubular and Water Tube Boilers, Corliss Engines, Jones' Mechanical Stokers, Hoisting Engines, Riedler Air and Gas Compressors, Riedler Pumping and Blowing Engines, Cornish Pumps, Roots Blowers, Copper Converters, Pyritic Smelters, Horseshoe Roasting Furnaces, Comet Crushers, Crushing Rolls, Stamp Mills, Shoes, Dies, Perforated Metals, Sectional Machinery, Huntington Mills, Frue Vanners, Bridgman Samplers, Concrete Mixers, Heavy Machinery and Mine Supplies. = = Write for Catalogues

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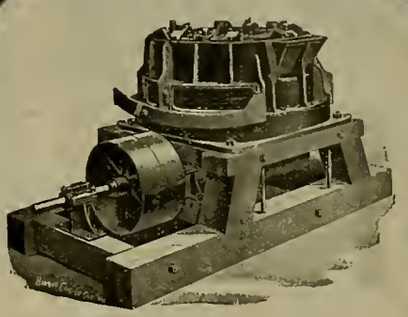

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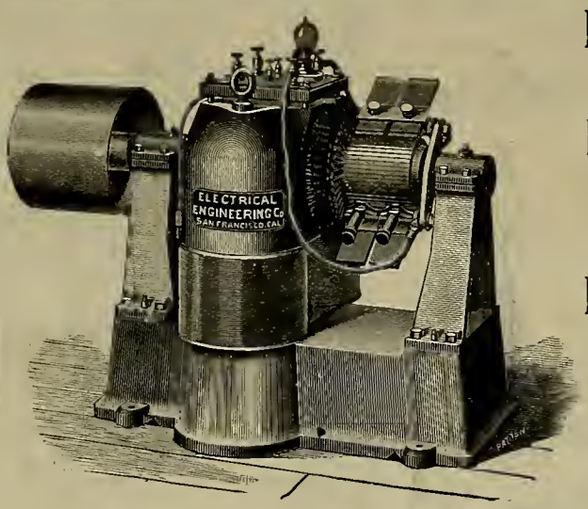

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Market Reports.

The Markets.

SAN FRANCISCO, March 7, 1895.

There was no change of note during the week. Silver has settled down to a steady "60½" day after day. The suggestion made in this column a few weeks ago that the silver market should be here and not in London, has been copied approvingly in nearly every mining journal of any importance all over the country. On this subject the following regarding the manipulation of the silver market is of interest:

The bulk of the silver bullion business done in London passes through five brokerage firms. These are the houses of Samuel Montague & Co., Sharpe & Wilkins, Mocatta & Goldsmidt, Pixley & Abell and H. A. Hertz. The second, third and fourth-named firms absolutely and arbitrarily fix the daily price of silver. The first and fifth named firms could doubtless be members of the combination, but for reasons of their own prefer not to be bound by its rules. They accede ordinarily, however, to the price as fixed. Representatives of these three firms meet every day in the office of Sharpe & Wilkins, and, at 2 P. M., give out the price for the day to the waiting crowd. This is telegraphed at once to the exchanges of the world. The price, however, is really fixed by foreign banks which purchase silver, and with which these brokers have previously been in consultation.

Except for an abortive attempt by American producers a few years ago, no serious effort seems ever to have been made to resist this arbitratory rate. London purchases about about two-thirds of the entire silver product of the world, and of the remaining third America consumes the larger part. These five firms thus represent the purchasers of practically two-thirds of the product.

Until a few years ago the first four named firms did practically all the business, but the London clearing-house, through which the Rothschilds and other large firms operate, added silver to its transactions, and is now a large purchaser. Last year its transactions were 23,000,000 ounces. Its representative is H. A. Hertz. Inquiries made in several most influential quarters by a *World* representative would seem to indicate that, while the arbitrary action of these firms is much resented by the producers, the remedy is really in the hands of the mining companies, if they should combine against the solid combination of the chief buyers. It is stated by the brokers themselves that their only clients are these purchasers, and that the American producers do not employ them, and that therefore their sole interest is to fix the lowest price possible. Buyers are united, while sellers are supine and divided. Only Chile and the South American States send their silver product directly to London for sale by brokers acting in behalf of producers, and are therefore anxious to get the best price possible for their clients. Producers in the United States, on the contrary, keep their product at home until it is sold at the price fixed in London, with no effort apparently and no concerted action to make it to the interest of brokers here to get higher prices. It is the opinion of at least one of the firms above named that the price of silver would be materially enhanced, but of course only after a severe struggle, if American producers should, acting in concert, ship their silver here in advance of sale, as do the South American States, and make it to the interest of Loudon brokers to get the highest instead of, as now, the lowest price.

The San Francisco agents of China and Japan hankers are checking the flow of silver from Colorado, Utah and Nevada to the Orient by way of New York and are shipping bullion to Hongkong and Yokohama from this port. These silver shipments are increasing monthly.

The Selbys separate the gold and silver in the hullion, after which the silver is reshipped abroad in solid bars. The cost of shipping one thousand dollars in fine silver from Denver to Hongkong via New York and London is $18.06, and by way of San Francisco $14. The Bank of California and the French bank here have in a large measure changed the flow of the immense silver output, which is a commercial triumph for San Francisco.

China, Japan, India and other Oriental countries have for years been the largest consumers of silver in the world, having received through San Francisco and London during the past six years $342,000,000.

In the nine years ending December 31st, '94, the shipments from San Francisco to China and Japan amounted to $97,164,480 in silver bars, and 111,023,432 Mexican dollars.

For some months past the silver product of the many big properties in Utah and Colorado has been marketed here, for direct shipment to the silver-using countries of the Orient. The Ontario and Daly mines are among the Utah producers which have disposed of their output in this manner. The San Francisco market rules a few points higher than the New York quotations, and there is an advantage in the cost of transportation.

Owing to the relations existing between England and India it is not probable that silver consigned to India will be sent by way of San Francisco. London merchants and bankers have a monopoly of that business and will retain it as long as they can, as the English Government coins the silver sent to India into rupees and of course makes a large profit on the coinage.

New York Metal Market.

NEW YORK, March 7.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.
COPPER—Brokers', 9.60c; exchange, 9.80c.
LEAD—Brokers', $3.02½; exchange, $3.07½.
TIN—Straits, 13¾c; plates, ——c.
SPELTER—Domestic, $3.20.

New York Prices.

NEW YORK, Mar. 7.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	27⅝	60¾	9 60	3 02½
Saturday	27⅝	60½	9 60	3 02½
Monday	27¾	60½	.....	.....
Tuesday	27¾	60⅝	.....	.....
Wednesday	27¾	60⅝	9 60	3 02½
Thursday	27¾	60½	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½c
New York Telegraphic Transfer	7½c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.89½
Refined Silver, per ounce	60½
Mexican Dollars, nominal	49@49½

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	6 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 75
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, bard			12 50
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	8 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	11 00	@	— —
Egg, bard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'	75c	₩	bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

San Francisco Stock Board Sales.

SAN FRANCISCO, March 7, 1895.

9:30 A. M. SESSION.

200 Alpha Con	09	200 Gould & Curry	55
100 Belcher	44	100 Hale & Norcross	1 20
600 Best & Belcher	91	100	1 25
200 Bullion	24	200 Mexican	89
200 Caledonia	11	250 Opbir	1 85
150 Challenge	44	200 Overman	17
100 Chollar	59	300 Potosi	55
350	58	100 Seg Belcher	08
400 Con Cal & Va	2 80	100 Sierra Nevada	69
30 Confidence	1 60	5 Union	50
150	1 50	600 Yellow Jacket	66
400 Crown Point	48		

SECOND SESSION—2:30 P. M.

500 Alpha Con	09	200 Julia	02
50 Alta	32	300 Mexican	92
300 Belcher	47	300	93
200 Best & Belcher	94	400	94
300	95	1000 Occidental	05
200 Bodie	92	700 Ophir	1 90
100	90	200 Overman	17
200	90	300 Potosi	56
400 Caledonia	12	100 Savage	47
800 Chollar	59	100 Sierra Nevada	71
700 C. C. V	2 90	650 Union Con	55
15	2 95	400	56
550 Crown Point	49	700 Yellow Jacket	67
1150 H & N	1 25		

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING FEBRUARY 26, 1895.

534,776.—PRUNE PRICKER—A. L. Bancroft, S. F.
534,777.—AMALGAMATOR—Bandouin & Southern, Crass Valley, Cal.
534,737.—PROPELLER—J. J. Brandt, S. F.
534,783.—FRUIT GRADER—A. Cerruti, S. F.
534,866.—PULVERIZER—W. E. Downs, Sutter Creek, Cal.
534,875.—DUST PAN—K. W. Gress, S. F.
534,644.—SAWMILL CARRIAGE—D. B. Hanson, S. F.
534,904.—POWER TRANSMITTER—J. W. I. Morris, Summerland, Cal.
534,915.—GEAR PROTECTOR—W. Richardson, Truckee, Cal.
534,667.—BELT GUIDE—M. G. Ring, Sherman, Cal.
534,983.—DREDGER—A. W. von Schmidt, S. F.
534,922.—SICKLE BAR—J. Shenett, Gardiner, Or
534,772.—HYDRAULIC MOTOR—S. J. Tutthill, Ashland, Or.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied	Delinq't	Sale.	Secretary.
Belcher S M Co, Nev	50	25c	Mar 5,	Apr 9,	Apr 30	C L Perkins, 309 Montgomery
Booth G M Co, Cal	5	2c	Feb 18,	Mar 25,	Apr 17	Geo R Spinney, 310 Pine
Bullion M Co, Nev	44	10c	Jan 21,	Feb 26,	Mar 21	R R Grayson, 331 Pine
Bullion Con G M Co, Cal	1	10c	Feb 19,	Mar 25,	Apr 25	C A Grow, Mills Building
Challenge Con, Nev	18	5c	Feb 19,	Mar 26,	Apr 16	C L McCoy, Mills Building
Con New York, Nev	13	5c	Feb 19,	Mar 26,	Apr 17	Cbas E Elliott, 309 Montgomery
Crescent M Co, Cal	1	10c	Jan 15,	Feb 16,	Mar 11	A K Durbrow, 309 Montgomery
Eureka Con, Nev	13	25c	Feb 19,	Mar 25,	Apr 11	H P Bush, 134 Market
Golden Eagle M Co, Nev	1	15c	Jan 8,	Feb 28,	Mar 4	E B Holmes, 309 Montgomery
Gould & Curry S M Co, Nev	75	15c	Jan 17,	Feb 19,	Mar 12	A K Durbrow, 309 Montgomery
Granite G M Co, Cal	2	1¼c	Jan 2,	Mar 9,	Apr 6	Wm Schaw
Inyo Marble Co, Cal	26	10c	Jan 21,	Mar 6,	April 5	W W Sargeant, Mills Building
Iowa M Co, Nev	20	5c	Mar 6,	Apr 9,	Apr 27	R L Thomas, 419 California
Julia Con M Co, Nev	26	5c	Feb 13,	Mar 20,	Apr 10	J Stadtfeld, Jr., 309 Montgomery
Justice M Co, Nev	58	10c	Feb 9,	Mar 14,	Apr 3	R E Kelly, 309 Mootgomery
La Grange H M Co, Cal	10	35c	Feb 23,	Apr 1,	Apr 22	A Halsey, 328 Montgomery
North San Juan G M Co	1	12c	Jan 28,	Mar 8,	Mar 27	H W Morris, 143 First
Osborn Hill G M Co, Cal	4	25c	Feb 27,	Apr 4,	Apr 24	R R Grayson, 331 Pine
Reed M & M Co, Nev	1	2c	Dec 31,	Feb 11,	April 8	John H Isbam, room 33, Mills Bldg.
Sierra Nevada S M Co, Nev	108	25c	Jan 16,	Feb 20,	Mar 11	E L Parker, 309 Montgomery
South Eureka M Co, Cal	17	1c	Feb 20,	Apr 1,	Apr 22	A Halsey, 328 Montgomery
Standard Gravel Co, Cal	1	12c	Jan 25,	Mar 4,	Mar 23	W H Schmidt, 207 East
Starlight Mining Co, Cal	5	10c	Feb 11,	Mar 18,	Apr 8	H R Williar, 214 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Bullion Con G M Co	C A Grow, Mills Building	March 9
Chollar M Co, Nev	C E Elliott, 79 Nevada Block	March 20
Hale & Norcross, Nev	A B Thompson, 36 Nevada Block	March 13
Potosi M Co, Nev	C E Elliott, 309 Montgomery	March 13

Mining Share Market.

SAN FRANCISCO, March 7, 1895.

Favorable news was received from the Comstock during the week, and there was increased business at stronger prices.

Money paid for labor on and around the Comstock in February aggregated $68,501.66. The pay roll of the Con. Cal. and Va. mine was $9403, the Ophir $3389, Chollar $4948, Hale & Norcross $2168.50, Yellow Jacket $2727, Crown Point $4298, Belcher $3046 and Alta $2414.

Following is a statement of the cash balances of certain mining companies on the first Monday of March as required by law.

BODIE MINES.			
Bodie	$11,611	Con. New York	510
Bulwer	2,473	Crown Point	295
Mono	4,158	Exchequer	2,486
Syndicate	839	Gould & Curry	13,451
WASHOE MINES.		Hale & Norcross	19,243
Alpha	$6,143	Justice	160
Alta	10,612	Kentuck	3,671
Andes	5,494	Lady Wash'n	2,104
Belcher	2,453	Mexican	15,097
Best & Belcher	14,418	Ophir	8,078
Bullion	8,671	Overman	6,759
Caledonia	3,222	Occidental	466
Challenge	106	Potosi	20,460
Chollar	6,358	Savage	3,568
Con. Cal & Va	94,520	Sierra Nevada	20,915
Con. Imperial	841	Silver Hill	1,294
Confidence	7,225	Union Con	13,053
		Utah	2,162

The delinquent assessment sale of the Confidence took place yesterday. Less than 100 shares were sold for non-payment.

The following illustrates the changes of the week:

Mines.	28	7
Alpha	.....	$ 09
Alta Consolidated	$ 33	32
Andes	26	.....
Belcher	46	47
Best & Belcher	77	95
Bodie	83	92
Bullion	.....	24
Challenge	40	44
Chollar	54	59
Confidence	1 35	1 60
Consolidated California and Virginia	2 55	2 95
Consolidated New York	.....	.....
Crown Point	47	49
Exchequer	.....	.....
Gould & Curry	49	55
Hale & Norcross	98	1 25
Justice	.....	.....
Mexican	74	94
Ophir	1 55	1 90
Overman	15	17
Potosi	50	56
Savage	44	47
Sierra Nevada	61	71
Union	44	56
Utah	06	.....
Yellow Jacket	59	67

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CONCENTRATOR AND AMALGAMATOR.—Henri Baudouin and Joseph Southern, Grass Valley, Cal. No. 534,777. Dated Feb. 26, 1895. This invention relates to an apparatus for working the ores of precious metals. It consists of a band journaled upon a vertical shaft and having a crank or cam connection by which it is caused to oscillate backward and forward around this shaft. The pan has an inclined bottom with annular overflow channels to contain quicksilver, and a correspondingly channeled disk supported above the bottom, having its inner side inclined with relation to the bottom in a horizontal plane. A central receiver around the top of the shaft serves to receive the pulp, and from holes around the bottom of the receiver this pulp is distributed outwardly over plates or screens, falling thence through upon the inclined and channelled disk where it encounters the quicksilver upon the surface of the disk and passes thence to the corresponding quicksilver channels in the bottom of the pan. Above the plate are copper and zinc hoops suitably arranged to produce an electrical action when they dip into the current of passing pulp. The hoops and battery elements are properly supported by arms above the plates and bottom. A suitable discharge is arranged for the waste pulp, either at the periphery or center of the pan, according to the angle at which the bottom is formed.

ROD COUPLING.—Ellery M. Hoagland, Salinas, Cal. No. 534,507. Dated Feb. 19, 1895. The object of this invention is to provide a coupling for rods, which can be quickly made and broken, and while coupled will remain absolutely secure, thereby especially adapting the device for the joining of all rods, and particularly the rods used in well boring. In well boring it is required that the tool below be often withdrawn to discharge and to clear it. This, after it has gone down a considerable depth, is a matter of time, as it is necessary to uncouple the section of the rod as the device is hauled up, and as it is put down again to couple the sections together once more. It is therefore of the greatest importance that the coupling and uncoupling be done with great facility and rapidity; but at the same time the coupling should be an accurate and positive one, precluding all danger of becoming accidentally uncoupled, and one which will permit both the churning action and the rotary movement without lost motion or without yielding or giving in the slightest. These results are all reached by this coupling, which consists of a sectiou having a shank reduced in thickness and provided with a notch in one of its edges, a second section having a hollowed or recessed body portion opeu at both sides with a directing wall closing a portion of the opening at one side and a stop wall closing a portion of the opening at the opposite side, and disposed in a plane below that of the directiug wall, said stop wall adapted to engage the notched portiou of the first named section.

FAIRFAX VILLA COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 19th day of February, 1895, an assessment, No. 2, of one hundred dollars ($100) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of March, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 16th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office—Room No. 56, No 309 Montgomery street, San Francisco, California.

CHALLENGE CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the nineteenth (19th) day of February, 1895, an assessment (No. 18) of Five Cents (5c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 38, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-sixth (26th) day of March, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on TUESDAY, the sixteenth (16th) day of April, 1895, to pay the delinquent assessment, together with cost of advertising and expenses of sale.

By order of the Board of Directors.

C. L. McCOY, Secretary.

Office—Room 35, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

BOOTH GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Auburn, Placer county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the eighteenth day of February, 1895, an assessment (No. 5) of Two (2c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, No. 310 Pine street, Room No. 28, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on WEDNESDAY, the seventeenth day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. R. SPINNEY, Secretary.

Office—No. 310 Pine street, Room No. 28, San Francisco, California.

IOWA MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia City, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of March, 1895, an assessment, (No. 20) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 2, 419 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of April, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on SATURDAY, the 27th day of April, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. L. THOMAS, Secretary.

Office—Room 2, 419 California Street, San Francisco, California.

Coast Industrial Notes.

The Standard Con. Mining Co. is having a Dow pump built for the main shaft.

The Los Angeles Consolidated Electric Railway Company bondholders will take control, improve the plant, and place the road upon a paying basis.

—The annual report of Charles Sleeper, manager of the San Francisco Clearing-house, gives the clearings in 1894 at $675,526,806, against $699,285,778 in 1893- a decrease of $10,758,972.

The Mexican government has pledged itself to admit free of duty all materials and machinery to be erected on the grounds of the international exposition to be held at the City of Mexico in 1896. Greatly reduced railroad rates are also promised.

—H. A. Robertson, of this city, one of the owners of the big pile raft that went to pieces some months ago while being towed here has commenced on another one near Astoria, Oregon, which, when completed, will cost $30,000. No attempt will be made to tow it to San Francisco until summer.

—The contract for the Hayward mill at Silver Bow Basin, Juneau, Alaska, has been given the Union Iron Works. It will be 30 stamps, and will cost in place, ready for work, about $51,000. The mill is to be delivered May 1st., and 30 days after the company will be able to begin crushing 100 tons a day.

The Union Iron Works is patiently awaiting the arrival from the East of the belt armor for the battle-ship Oregon. It was scheduled to reach here as far back as 1892. It was subsequently ordered in 1894, and is now expected to arrive any day. When the armor is placed in position the battle-ship will be completed.

W. B. Honeyman, of the Portland linseed oil works, has made contracts with Linn county farmers, in Oregon, for 2000 acres of flaxseed, for which he has contracted to pay $1.80 per hundred. This will bring to the growers something upward of $20,000. Mr. Honeyman furnishes the seed to sow the 2000 acres.

—The colossal figure of Progress, which will surmount the dome of the City Hall, has been modelled by Marion Wells, the sculptor, and will be soon cast. It is 22½ feet high, and represents a winged female holding aloft a torch. At night this torch will be brilliantly illuminated. It will be over 300 feet above the sea level.

—The New England Fish Company, whose headquarters are at Boston, and who have been fishing for halibut in British Columbia waters all winter, have closed the season's operations. The total catch for the season amounted to 900,000 pounds, and the price realized was about seven cents per fish. Twenty-five cars were shipped east.

A Co-operative Company has been organized to reopen the Renton coal mine, ten miles south of Seattle, Wash., which has been closed for the last eight years. It was last operated by Mr. Simpson of San Francisco, but when his miners struck he closed it and has never reopened it. The company, with $100,000 capital stock, will be composed of miners and consumers, none of whom will be allowed to vote more than ten shares, and expects to employ about 300 men.

The new west-bound freight tariff from Chicago and common points, and from Mississippi and Missouri River common points, went into effect last Tuesday. The new rates do not effect California consumers very materially save in the case of iron and iron commodities, which are raised from thirty cents to fifty cents, as the minimum rate. The rates do not apply to points in California south of Lathrop, Stockton or San Jose, on shipments routed via Portland, Or.

—A syndicate of well-to-do Italians have hit upon a novel plan to supply the San Francisco market with fresh halibut. They have purchased the once famous racing yacht Cyclone, and intend putting in a large well amidship capable of holding many thousands of gallons of water. In this way a whole cargo of fish, caught on the halibut banks, can be kept alive until delivered at the city markets. By this means they expect a much higher price for their product than do the fishermen who bring in their product dead.

James Treadwell, president of the San Francisco and San Joaquin Coal Company, says: "There are twenty million tons of coal in sight near Livermore. The location is eight miles southeast of Livermore, and the seam has been traced six and a half miles in length and a mile in width. This coal is so abundant, and is extracted so cheaply, that it can be mined and shipped to Oakland with a profit at $1.50 a ton." If so, this would revolutionize manufacturing methods of this city, where cheap fuel is the one great lack.

—The largest wooden drydock on the coast was launched yesterday, at Benicia, for the California Drydock Company, at the foot of Spear street, this city. Over 150 men worked on it for six months, and a million and a half feet of Oregon lumber, 100 tons of iron, 40 tons of copper and 29,000 pounds of yellow metal have been used in building it. Its length is 301 feet; depth of hold, 10 feet 9 inches. The pumping plant of eight pumps, is guaranteed to lift 2,250,000 gallons of water in two hours. The cost of the dock, which will accommodate a steamer 300 feet in length, is nearly $200,000.

Traffic relations with the Santa Fe, Prescott and Phoenix road have been opened by the Santa Fe, and it is anticipated that after the formal opening next Monday there will be considerable travel in that direction. The road runs from Ash Fork, on the Atlantic and Pacific division of the Santa Fe system, to Phoenix, the entire length of the line being 196 miles. Among other of the principal owners of the road are reported to be the following capitalists: N. K. Fairbanks, Chicago; Dexter M. Ferry, W. Bowen and S. Murphy, Detroit; C. Arms, Youngstown, O.; and W. Hadley, Los Vegas, N. M.

A new industry has been added to California's many sources of wealth. This is the cultivation of the yellow dock, botanically known as the canaigre, the root of which is used in tanning leather. This root contains thirty-two per cent of strong tannic acid. The wild dock grows all through the San Joaquin Valley, and with cultivation the root may be increased fourfold. As the supply of oak for tanning is running low, both here and abroad, the importance of this despised weed may be estimated. A company has been organized to plant five thousand acres of the dock in Merced, and a big tannery will be built.

—The battle-ship Olympia, built by the Union Iron Works, has been finally accepted by Secretary Herbert. The Naval Board of Examiners in their report take occasion to justly compliment the San Francisco builders, and say: "The board congratulates the department on the addition of the Olympia to the Navy of the United States, which, with its great fighting power, speed and elegant appearance, is a credit to the navy and American mechanical skill. It is with great pleasure that the board calls attention of the department to the excellent work done by the Union Iron Works, their care in all the details of construction and the clean and finished condition of the vessel."

—The work of constructing branch lines of the Mexican International railroad, from Monclova, Mexico, to Sierra Mojada, and from Reatea to Monterey, has been suspended, the order coming from C. P. Huntington not to construct the branches at the present time. It is said he and his associates have been trying to get control of or to purchase or lease the Monterey and Mexican and Gulf railroad, which is one of the most profitable railroad properties in Mexico, and it is hinted that the building of the proposed extensive joint lines of the Mexican International was an attempt to bluff the owners of the Monterey and Mexican and Gulf into making a deal. The proposed branches would be competing lines against the Gulf Coast.

—The new whaleback steamer City of Everett arrived here last Monday, sixty-two hours from Port Townsend. She brought down twenty-three passengers, among whom was Captain McDougall, the inventor. She carries 3800 tons of coal on a mean draft of 19 feet 6 inches. On the deck are four big tarrets, each containing two hoisting engines. The vessel has eight hatches, which open nearly the entire length of the ship. Her engines are triple expansion. The deck is protected by heavy wire cables stretched from iron stanchions at intervals of fifteen feet. The main house rests on two tarrets set on the after part of the deck, from which two gangways run forward to the bridge, on which is the captain's room, pilot and chart house. Steam steering-gear is used. The Everett will discharge at Port Costa and return to Comax, B. C., in ballast.

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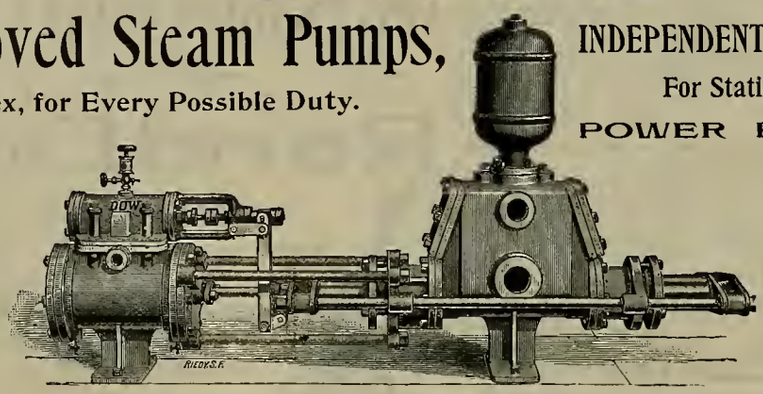

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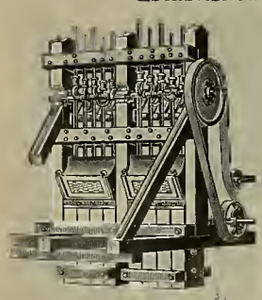

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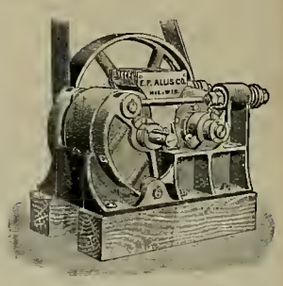

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FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN LEGAL SIZE, 12 X 36 INCHES, THE MINE BELL SIGNALS AND RULES PROVIDED FOR IN the Voorhies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We can furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market Street, San Francisco, Cal.

MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 11. SAN FRANCISCO, SATURDAY, MARCH 16, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

De Beers Con. Mine Report.

From Gardner F. Williams, head manager, is received the sixth annual report of the De Beers consolidated mines, of Kimberly, South Africa. During the year the diamonds produced realized £2,820,172; the expenditure was £1,690,584, leaving a profit of £1,129,588—about $5,645,000 on a capital of $19,750,000. The magnitude of the scope of this great company is illustrated by their reserve fund of £726,000; their £300,000 investment in the British South Africa Co., and their large holdings in colonial railway and coal companies.

The average number employed in the De Beers-Kimberly mines during the year was 8113—1507 whites and 6606 blacks.

The "nationality of employes" table is interesting:

	In and About the Mines and Floors.	*At the Workshops.*
English...	52.2	41.5
Scotch	6.2	23.3
Irish...	4.8	2.4
Colonial..	33.1	27.1
European.....	1.8	4.2
Other nations..	1.9	1.5
Total.....	100	100

Accompanying the detailed financial report are elaborate plates illustrating the plan and workings of the mine and plant.

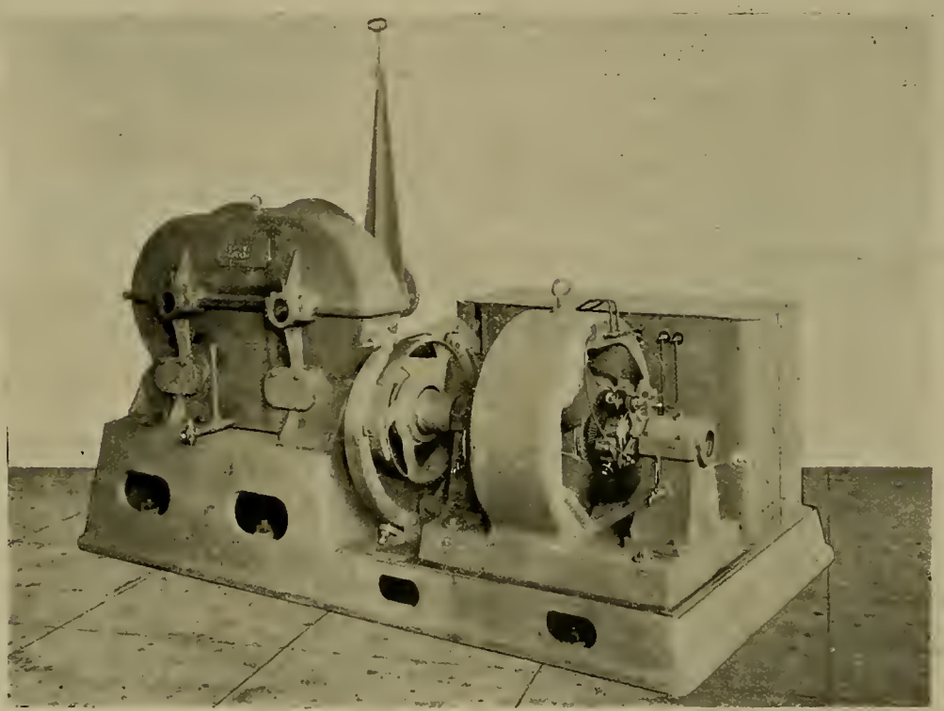
At the general meeting Cecil J. Rhodes presided. Among other things he said:

"Gentlemen, we made an effort in America to show our diamonds to the Americans during the great World's Fair at Chicago, and we spent £10,000 upon our exhibit. Brother Jonathan, with his usual cleverness, as soon as he had seen our diamonds and was gratified by our expenditure, attempted to put a prohibitive duty upon them. I do not blame Brother Jonathan, but one of the amusing things about it is that, having promoted a big show, and having invited the world to that show, as soon as it is over, he says: 'I don't want to see you again.' I do not know if we would be wise in retaliating. I believe in free trade, but I also believe in reciprocity; and at the same time I think if we were to shut our doors to Brother Jonathan it would bring him to his senses, so far as regards his raw products. At any rate, the company will not ask you again to spend £10,000 on such an undertaking; for I fully believe that the next time he has a big show, and we were to spend a further £10,000, Brother Jonathan would pass a law by which on no account would he allow diamonds into the United States, so that it will be better in future to leave Brother Jonathan alone."

Le Journal de l'Horlogerie says a new amalgam has been discovered which is a wonderful substitute for gold. It consists of ninety-four parts of copper to six parts of antimony. The copper is melted and the antimony is then added. Once the two metals are sufficiently fused together, a little magnesium and carbonate of lime are added to increase the density of the material. The product can be drawn, wrought and soldered just like gold, which it almost exactly resembles on being polished. Even when exposed to the action of ammoniacal salts or nitrous vapors it preserves its color. The cost of making it is about twenty-four cents a pound avoirdupois.

An Electric Elevator.

The accompanying cut represents a double-worm, direct-connected electric elevator, one of three recently made and erected by the Electrical Engineering Company, of 34 and 36 Main street, this city, for the Whittier Block, Los Angeles. They are said to



DOUBLE-WORM DIRECT-CONNECTED ELECTRIC ELEVATOR.

work to perfection. The motor, hoist and electric-controlling device, it will be seen from the cut, are all compactly mounted on common base plate which occupies a minimum amount of space. The elevator is entire controlled by pull rope or lever in the elevator cage. The controlling device is entirely enclosed in iron casing which protects it from dust and dirt, and is unique in this, that there is an entire absence of sparking at contact points. The motor is one of the company's latest multipolar type, slow speed and highly efficient.

TEN years ago the mines of California were at a discount in the East. Now they are at a premium, business men and investors realizing that, in these days of almost impossible profits in business, nothing equals in value a gold mine as a dividend producer. It is also noticeable that nearly all the really successful mining operations of the larger sort, the big enterprises, are projected by corporations. The day of the combine has arrived in mining as in other enterprises, and an aggregation of skill and capital alone starts and maintains the largest mining enterprises of the day.

Idaho's Mining Bill.

The new Idaho mining bill has become a law. It is in brief the general law with some changes to suit the mining conditions in that State.

Mining claims may extend to 300 feet on each side of the middle of the vein or lode. The locator must locate by posting on the surface a plain and permanent sign or notice containing the name of the locator, the name of the claim, length and width and date when the location is made, and by marking within ten days thereafter the surface boundary of the claim. Any claim so located is not, unless abandoned, subject to location by any other person for sixty days thereafter. Surface boundaries must be marked by substantial posts or trees not less than four inches square or in diameter.

Within sixty days after such location the locator must sink a shaft upon the lode to the depth of at least ten feet. Notice of location must be filed within ninety days thereafter with the county recorder or his deputy. An affidavit that the prescribed work has been done must be filed. County recorders must appoint deputies. Only citizens of the United States, or those who have declared their intention to be such, can locate a mining claim.

The bill has been endorsed by the leading mining men of that State.

IT is of daily occurrence to note the formation of a new mining company with "capital stock $1,000,000," or $5,000,000, or more. It is hardly necessary to say that there is often considerable difference between the amount of money actually subscribed and the "capital stock." A company with a "capital stock" of $1,000,000 may not have enough actual stock subscribed to buy a stock subscription book. Capitalization has nothing to do with the value of the stock or the property, though it is evidently supposed to influence opinion. There is no law against capitalizing a piece of property worth $150 at $10,000,000. Those figures are always nominal, and usually harmless. It is largely a matter of custom and should be "more honored in the breach than in the observance."

FROM the increased appearance in the columns of our interior contemporaries of a large number of applications for patent, it is evident that the recent advice of the PRESS is being followed. It is a good move at any time to secure a U. S. patent for a mining claim—it settles all possibility of litigation, and if it comes to a question of sale, a patented claim can in nearly all cases be sold easier than an unpatented one.

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Our latest forms go to press on Thursday evening.

J. F. HALLORAN.....General Manager

San Francisco, March 16, 1895.

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CALIFORNIA annually expends $1,710,000 on its roads—"mainly in keeping bad roads in poor repair."

THE Manufacturers' Convention, which meets next Tuesday in this city, has the hearty co-operation and support of all who want to overcome the inertia of assuming that anything "made in the East" is necessarily better than if made here. The habit of sending East for nearly everything manufactured is a long standing one; but agitation, effort and business organization can overcome it.

"Two American prospectors in New Mexico have swindled an English representative of a British syndicate out of $50,000 by a salted mine." That is in every way reprehensible. The only place anything like that is admissible is in the national capital under administrative auspices, where it is the Americans who are swindled; the executive chiefs of the nation and the British bond buyers being the parties of the second part.

COMPARED with the "boom" in South African and Australian gold-mining concerns, the renewed activity in gold mining on this Pacific coast is as the murmur of a rivulet to the roar of Niagara. On Witwatersrand stock, though watered to the saturation point—the companies' nominal value being nearly £200,000,000 sterling—a profit of nearly 22 per cent on that enormous sum was secured in '94, and as new regions in that ancient land of Ophir are discovered and new reports of gold probabilities reach London, the rush for all kinds of mining shares in all kinds of places recalls the days of Laws' South Sea Bubble. Let it be hoped the cases are not parallel.

SECRETARY OF THE INTERIOR SMITH has ordered that all patenting of land to the Central and Union Pacific railroads be suspended till affirmative action is taken toward the settlement of the Government debt due from those roads. This must not be understood, however, as affecting the matter of mineral-land claims on the part of the S. P. Co. et al, whose applications for patents are now being published. Last Monday's Sacramento *Record Union* publishes a railroad application for over 200,000 acres, this being the latest of such publications observed. Miners in Trinity, Shasta and Siskiyou have only two weeks more—till the 30th inst.—to file protest at the Redding land office if they find their claims in the land listed at the land office at that place.

THE S. F. & S. J. V. R. R. is assured of a San Francisco terminal. The company calls now for sealed proposals, which will be received next Wednesday at the office, 321 Market street, for the delivery of ten thousand tons of 62½-lb. steel rails, best quality, on the wharf in San Francisco. Pattern to be submitted with bid. Bidders are also requested to make bids for 75,000 angle plates to fit above rail; also for 4800 kegs railroad spikes, size 5½x$\frac{9}{16}$; also for 150,000 railroad track bolts ¾x3½ hexagonal nuts. The first shipment of not less than one thousand tons will be required to be made within thirty days after time of placing the order. Shipments to be made thereafter at the rate of not less than two thousand tons per month until completion of contract. That sounds like business. Later on the company will want engines and cars. It is believed that no insuperable obstacles exist against manufacturing such rolling stock in this city. This is a matter that the Manufacturers' Convention, which meets next Tuesday, can with great propriety consider.

LIKE Colorado, Nevada is forced by existing conditions to change from a silver State to a gold State, and is equally fortunate in being able to demonstrate the existence of gold fields within its borders. In gold production there is no business jealousy or need of rivalry; the more gold the better. Nevada is desirous of attracting the attention of Eastern capitalists. In this regard a word may fittingly be uttered. Confidence is a plant of slow growth; some Nevada mining enterprises in days gone by were not wholly conducive to promoting that confidence in mining operations so necessary to the co-operation of the confiding capitalist. Now that the just attention of millions of Eastern idle money is turning to probabilities of profit in gold-mining enterprises, disposition to invest can best be augmented by strict attention to accuracy of statement and the absence of possibility of exaggeration in any particular case.

THE Butte, Montana, District Court recently rendered a decision which, if sustained, will have unwholesome effect. The owner of a mine made a contract by which the party contracted with was to operate his mine for a certain time, and make certain improvements with the privilege of buying it, a stated proportion of the proceeds of the ore to be paid to the owner, which would be credited on the price in case the mine was bought. If not, all the payments and improvements were to be forfeited. The contractor made improvements on the mine for which he did not pay, failed to buy the mine and turned it over to the owner with the improvements. The court held that he was the agent of the owner, under contract to operate the mine, and that it was subject to a lien for supplies and materials furnished at his request. If this hold good, many a mine owner will fear to bond or lease his mine with working privilege, lest he be run into debt against his will or beyond his financial ability.

THE Governor has vetoed Assembly bill 55. He considers it "unwise and injudicious legislation." It passed both houses as a measure of justice to all parties, and in recognition of the right of appeal on the part of the miners. The only desire was to give the miner the same rights possessed by other members of the body politic. The Governor further says in defense of his veto that the adoption of the bill "would deprive courts of their well-established powers." There is no court in California that would be deprived of a shadow of any inherent jurisdiction or just powers by the practical workings of the bill vetoed. The veto was sustained by a vote of 30 to 45. This does not end the matter. It only postpones the victory of right over might and the inertia of ignorance. The claims of the miners are too potent, the justice of their requests too manifest to be permanently set aside. Above and beyond Governors and courts is the greatest tribunal of all—public opinion—and it is fast being recognized that the great industry that is to-day the only prosperous one in the State cannot continue to be made the venting-ground of private spleen or ancient grudge. When the California Miners' Association met last November, the present executive made an address which spoke fair and promised justice to the miners. At the same time the Anti-Debris Association had a meeting in which they declared against anything the California Miners' Association convention might do or say. They didn't wait to see or hear what was said or done: they were "ferninst" the miners the same as the newly imported citizen was "ferninst" the Government. That was to be expected. But in the light of recent events, better treatment of such a manifest act of justice as Assembly bill 55 was expected from the chief magistrate of the State. The California miner doesn't ask favors nor does he expect partiality. But he has rights, no more, no less, than any other producer, and in this instance those rights have been denied him. As a matter of public policy, in the direct line of public interest, the veto is a mistake.

SECRETARY OF THE INTERIOR SMITH this week gave a point in favor of the Tyler Co., in its famous litigation with the Last Chance Mining Co., by ordering that a patent issue to the former. The main case is now being argued before the United States Supreme Court. The two mines are at Wardner, Idaho, the ground in dispute is worth $500,000; there is also involved $200,000 worth of ore taken out of the disputed area by the Last Chance, and claimed by the Tyler. The case has been in the Idaho courts for several years, was taken before the U. S. Circuit Court of Appeals in this city, where the Tyler people won. Then the Last Chance people succeeded in getting the Supreme Court to issue a writ of certiorari—something very unusual for the Supreme Court to do—and the case is now before the court of final resort. While this is pending in the court the Secretary of the Interior has settled a side litigation. Part of the Tyler claim overlapped the Last Chance. In its application for a patent it waived all right to the overlap. The Last Chance combatted the issuance of the patent because of the case being in the Supreme Court. Secretary Smith decides that cuts no figure in the matter, and that, as the Tyler waives all claim to the overlap, it shall have patent to the claim. In a third way the U. S. Government comes in in relation to this controversy. The First National Bank of Spokane, Wash., is one of the principal creditors of the Last Chance, and it, by reason of insolvency, is in charge of United States Controller of the Currency Eckles. So far, the Tyler has the best of it in the courts. Should the Supreme Court decide in its favor, that would of course be final. Should the decision be in favor of the Last Chance, that mine's attorneys say that would be practically final, because the Court of Appeals would then have to decide in their favor; but the Tyler attorneys contend that were a new trial ordered the result would depend upon the nature of the instructions sent back by the Supreme Court. Should the Last Chance win the suit the Spokane bank would be released from insolvency.

The True Reason.

Eastern papers, commenting on the increased activity here in gold mining, almost unanimously express doubt and fear regarding the "gambling mania," the "stock-jobbing proclivities," etc., of the industry, thus, singularly, showing their lack of understanding of the real facts. The natural turning of men to the mountains to get that which alone in these times has not depreciated in value, has no more to do with "stock jobbing" or "gambling mania" than the ocean steamship has with the gulls that soar and scream in her wake. It seems as if the "Eastern" press ought some time to be able to disassociate California gold mines from the idea of stock-market fluctuations. Those mines are rarely listed; their stock is not at the mercy of street manipulators; the ups or downs of shorts and coverers do not affect the value, and the real reason for the increased activity in California's gold-mining industry is because there is no better paying occupation in the world to-day. Gold is universally demanded; it will buy more of anything for sale than ever before: hence, naturally, men seek it with more ardor than ever before. With wheat at 50 cents, butter at 15, prunes at 4, wine at 12½, raisins at 3, eggs at 8, and everything else in the agricultural, horticultural and dairy world at like prices, the fact that gold is still worth $20.67 an ounce; that the market cannot be glutted, and that increased new processes make profitable the working of low-grade ore, attracts the attention of business men to the working of gold mines as a business proposition—a legitimate investment; and once realizing this fact, they of course investigate where the gold is and where the best experience has produced the best methods, and where the most likelihood of sure returns can be found. It is because of these facts, and not from any yearning for "gambling mania" or "stock jobbing," that Eastern men are now securing valuable gold properties in this State.

Concentrates.

THE exact value of a ton of gold is $602,027.23.

THERE will be no "suspension of assessments" for the current year.

LOS ANGELENOS are bonding properties in the new Mountain Springs district.

THE Gold Basin mining field is now the most extensive gold-producing region in Arizona.

THE "Alturas Gold Company," of Loadon fame, has been finally "wound up" in that city.

ALASKA papers say five times as many immigrants are going to the Yukon as can find a living.

ARIZONA ranks third in the production of copper, being surpassed by only Michigan and Montana.

THE English owners of the Twin Lake Placer Co., Colorado, have declared a $46,500 dividend for '94.

COLORADO proposes to hold an International Mining and Industrial Exposition in Denver next year.

THE Banner mill at Idaho City, Idaho, closed down last week for the season. It will resume crushing in July.

IT is expected that the present number of miners in the Pittsburg, Grass Valley (20), will soon be doubled.

THE Grass Valley *Union* says: "The new tariff law is having a beneficial effect abroad as well as at home."

MR. H. S. ALGAR is the manager of the Northwestern Mining Bureau, recently established at Seattle, Wash.

THE Le Roi is opened to a greater depth than any other mine in Kootenay. The working shaft is 360 feet deep.

THE Bi-Metallic Company at Phillipsburg is treating about 300 tons of ore per day and has nearly 500 men at work.

THE Oregon & California Mining and Milling Co. expect to start the mill upon their property near Henley shortly.

ROBBERS scared away the watchman of the Daisy Hill mine at Grass Valley last Tuesday night and looted the works.

THE James Watson hydraulic gold mine, near Igo, Shasta county, has been issued a permit by the Debris Commission.

A BILL is pending in the Nevada Legislature providing for the consolidation of Storey, Ormsby, Lyon and Douglas counties.

PARK CITY, UTAH, ores—almost exclusively lead and silver—can be handled with profit, even with silver selling at sixty cents.

NEVADA COUNTY papers report gravel $3 to the pan, 200 feet wide and four feet deep, at the Harmony mine—a regular bonanza.

FIRE in the Old Abe mine, near San Antonio, New Mexico, last Saturday, proved fatal to eight poor fellows who perished near the shaft.

IN Cripple Creek and Leadville, the two best mining camps of Colorado, the leasing system is the present favorite method of development.

THE incline on the Queen, Golden Cross M. & M. Co., Hedges, Cal., is down 450 feet. Seventy men are employed at the mill and mine.

SEVERAL experienced Nevada county miners have gone to South Africa and British Columbia, where good positions have been assured them.

THE Boston & Montana smelter at Great Falls is now running at its full capacity. For some time past it has been operated with a reduced force.

A PROPERTY OWNER of West Point, Calavoras Co., recently advertised for a lawyer to locate in that lawyerless town. The want was immediately supplied.

THE Rio Grande Western Ry. Co. is still boring for water at Salt Lake City, Utah; and has secured a depth of 1073 feet and appears to be getting a long well.

DISCONTENT and distress in Sicily have been increased by the closing of many sulphur mines. More than 25,000 miners have been thrown out of work recently.

THE Rico, Col., Smelting and Refining Co. has incorporated; capital stock, $100,000; directors: A. B. Roder, D. B. Ellis, F. T. Osgood, J. E. Searles and E. N. Senrles.

THE Debris Commission has granted a permit to operate to the James Slater mine, Brownsville, Yuba county, as soon as a restraining dam has been constructed and approved.

THE Snow Shoe mine, near Thompson Falls, Montana, has been sold to H. C. Walters of Spokane for $100,000. A 100-stamp mill will be erected on the mine in the spring.

ENCOURAGED by the success of the Wall street bond syndicate with Government representatives, gold brick swindlers are displaying renewed interest in their old business.

THE new town of Gaylord, Montana, where the Parrot Company intend building their smelter, is about four miles from Whitehall at the base of a spur of the Tobacco Root range.

CAPTAIN DE LAMAR is said to have invented an improved cyanide process, which he will test at the new mill recently built on the Monitor and Jim Crow gold mines at Ferguson, Nevada.

THE Hite Gold Mining Company has incorporated. Directors—William S. Chapman, G. H. Mangels, J. E. Mason, A. E. Shattuck and George C. Munro. Capital stock, $500,000; all subscribed.

THE Nickel Plate Mining Company is a new organization at Caldwell, Idaho, that has now under construction a large boat for the purpose of dredging Snake river to test a new gold-saving machine.

THE gold output of the Witwatersrand, S. A. district, seems to have reached high-water mark in December '94. The January output was 177,463 ounces—4641 ounces less than that of the preceding month.

THE Tacoma, Wash., banks have begun to take British Columbia coin from customers at par. The object is to increase the provincial trade with that city, and this it already has begun to do. Reports reach the banks, however, that the merchants, or at least some of them, are still discounting the foreign coin. For instance, a merchant may take a British Columbia 25-cent piece for 20 cents and deposit it in the bank, receiving 25 cents therefor, and making 5 cents, or 25 per cent, by the operation. If this is continued the banks say they will not accept the coin at par.

THE California Debris Commission has before it a large number of petitions for the resumption of hydraulic mines in various northern counties. Next Monday eight applications to resume hydraulic mining will be heard.

THE Albuquerque, Arizona, *Citizen* libels the reputation of territorial legislators in instancing the era of cheap prices by the allegation that "a majority in the lower house of the Legislature was recently bought for $87."

W. H. CLARK claims that his new mill in Butte, Montana, can treat every class af gold ore except tellurium. He asserts that all gold is free in ore except in tellurium ores, and backs his judgment by a $150,000 investment.

THE Anaconda, Montana, *Standard* claims to have inside information that the Burlington will be extended to Butte this year, connecting with the Butte, Anaconda & Pacific. The latter will also be built to Boise, Idaho.

THE Juneau, Alaska, *Mining Record* issues a souvenir edition for February that would be a credit to any community in the country. It is possessed of artistic merit and contains much of merit regarding the mines of that Territory.

THE general public does not hear of one mining deal in ten. The parties to the transaction, especially if it be a small one, usually give out no information. A complete record of the mining transfers made in the State for one day would be interesting.

THE "lost Peg Leg mine" has been discovered again, this time by Mr. Chas. Achterman in the Cahuilla reservation, Riverside Co. It is alleged to be "in a saddle on the San Jacinto range of mountains," with its headquarters evidently where its headquarters ought to be.

L. C. BRAGO has changed the National City, San Diego Co., reduction works into a cyanide plant, and is treating the tailings by that process. These tailings are from rebellious ores from Cedros islands, and contain from $10 to $20 per ton. The company now has 5000 tons of tailings which will be worked.

AT the Gold Ridge mine, near Graniteville, Cal., last week, George Dey and John Rennie were working in a drift and were putting in a blast. One of the caps exploded and fell in the box of caps, causing them to all explode. Dey was killed outright and Rennie injured so badly that he is not expected to live.

H. L. CHILDS, of Montana, and some New York and Newark, N. J., men, have incorporated the Syndicate Gold Mines and Mill Company, with a capital stock of $5,000,000. The articles say that the operations of the company are to be carried on in any part of the world. The principal office is to be at Virginia City, Montana.

THE coroner's jury has found that the gas explosion in the White Ash, Colorado, mine on the 27th ult., which killed twenty-four men, was due to lack of air, one air shaft being obstructed by water. Heavy damage suits will be instituted against the company by relatives of the victims, unless a compromise is effected.

A SYNDICATE of Denver men have bought a placer claim on Four Mile, Carbon county, Wyoming for $100,000. It was formerly owned by John C. Davis of Cheyenne and A. Kendall of Rock Springs. The purchasers will expend a quarter of a million dollars in developing the property. This is said to be the largest mining deal ever recorded in Carbon county.

THE Katie mine at Basin, Montana, has been attached for $73,000 by a number of creditors, among them being the Western Iron Works, which has a claim against the mine for new machinery furnished. This property is operated by the Glass Bros., one of whom is now in the East for the purpose of raising money with which to place the enterprise on its feet again. The Katie is considered one of the best properties in Basin.

"A PROSPECTOR brought fourteen pounds of ore into The Needles recently which netted him $4000. It was obtained from a quartz lead within sixty miles of that point." This is clipped from a city daily of the 5th inst. Fourteen pounds avoridupois is about 202.5 Troy ounces: thus the *ore* netted a fraction over $19.75 per ounce. When it is considered that the gold coin of the U. S. is only worth $18.605 per ounce, at fine gold prices, it is evident that this is pretty good ore.

THE Shasta *Courier*, referring to the time it was first published, March, 1852, says $50 octagonal coins were then plentiful, $20 pieces common, and $10 and $5 pieces rated as small change, while $2.50 and smaller coins were considered what is now called "chicken feed," and gold dust by the ounce was a legal tender for bills anywhere. The same may be said of Yreka in 1852-3-4-5. Ten dollars a ticket was the price to a ball or dance, 25 cents for a drink or smoke, and a dollar for a meal.

THE Land Department has recently decided: First—A settlement claim that will defeat the operation of a railroad grant must be of a character capable of being asserted by the party in possession under the settlement laws. Second—If having been held that a placer location of 160 acres by an association requires a discovery of mineral on each twenty acres, opportunity will be given the locators for a further showing where, under the rulings in force at the time of location, a single discovery was deemed sufficient.

SINCE the decision of the Department of the Interior, sustaining the claim of John H. McBride to 120 acres of school section 16 at Tacoma as gold-mining land, there have been six more filings on the already well-covered section. Three of these claims were filed lately. Rudolph Martin claims twenty acres; Louis Drexler claims ten acres, and Caroline Miller claims twenty acres. It is said the claimants are acting for other parties. Each location states the land is to be used for placer mining, which is very unlikely.

THE old days of the Mooneyville excitement near the Cliff House are recalled by the renewed activity in beach-sand gold mining on the ocean shore southward from Sutro Heights. There are four separate parties now at work, scattered along to the San Mateo Co. line. The sand is said to yield $2.50 per ton, and one party reports an ability to treat twenty tons a day. Several attempts through the years have been made to make these sands pay. They are almost limitless in quantity and contain gold, the same as in a hundred other localities along the California and Oregon coasts. Banta & Wink, of Port Orford, Or., write to the MINING AND SCIENTIFIC PRESS that their system at that place has proved to be a great success. They decline to give the formula of their secret chemical process, but claim they do not use any quicksilver. The workers at Mussel Rock and elsewhere below the Cliff House use the amalgamation process.

A PROPOSITION is before the Nevada Legislature to amend the Constitution so that patented mines can be taxed. The first Constitutional convention held in Nevada provided for the taxation of mines. That Constitution was overwhelmingly defeated and the convention which framed the present Constitution eliminated that clause and exempted mines and mining claims from taxation. The people ratified the Constitution and if they are now in favor of taxing patented and unpatented mines, that can be ascertained without much expense to the State by submitting the proposition to the voters at a general election.

THERE has never been a time in the previous history of Montana when so much interest has been taken in mining matters, says the Marysville *Messenger*. Even some of the old fellows who have stuck to their mines like grim death to an African, have given up the idea of becoming millionaires without work: and, being impecunious, have decided to bond some of their prospects and allow them to be developed. Judging from personal knowledge, and that gained from the press and individuals, we are confident that fully double the number of mines will be operated during the year 1895 than there were in the year 1894.

HETTY GREEN, the eccentric woman who possesses so many million dollars, is the owner of a mine near Sutter Creek, that was the original mine where one of California's wealthiest men got his start in life. The timbers took fire and ruined the shaft for further use, without the expenditure of a large sum of money, and the mine was transferred to the departed Mr. Green in payment of a claim. Although it is a valuable property, not a cent has been taken out of it for years, and Mrs. Hetty will neither work it herself nor permit any one else to work it. It is said that the present Assessor of Amador county contemplates raising the assessment on the property from $8000 to $100,000 and compel the lady to take some interest in her California property.

CONCENTRATION is having quite a boom at Idaho Springs and Central City, Colorado, and every mine owner is trying to get his ore to this kind of treatment. It is beginning to be understood that the ores are not sufficiently free milling to stand that method of milling. The Fisk made a test of ores at a concentrator in Idaho Springs last week and, it is said, got a return greater by forty per cent than the same ores bring at the stamp mills. A number of new mills are planned for Idaho Springs and will be built during the summer. The Newton, a new stamp mill, has been enlarged by the addition of a concentrating plant of fifty tons daily capacity, and the movement for concentration is so strong that there are more offers of ore than a mill of three times the size can handle. Many properties which could otherwise work are consequently forced to lie idle.

"A THOUSAND DOLLARS A DAY" is the name of an interesting fancy written by Miss Adelina Knapp, of this city, and published by the Arena Company, of Boston. The story tells of the effect of a general distribution of the wealth of the Golconda mine, in Arizona, throughout the United States. The mine being fabulous in extent and inexhaustible, $1000 in gold was to be given to every man and woman over eighteen years old every single day, and paid at the banks. The first day there was a thrill of delight at receiving the shining coin. Men settled up, or promised to settle, and made new purchases, and business boomed. In three days all work stopped. There were no policemen to guard the gold, because nobody wanted gold, nor would take it as a gift. What people wanted was bread, meat, cars to run, a sexton to attend to a burial perhaps, a cook, a carpenter. In time the mint stopped coining, gold was used for the arts and manufactures only, and labor was the only commodity for exchange. The capitalists and politicians, even, took their places and their turns at work.

A WOOD PILE in Lead City, S. D., belonging to the Homestake Gold Mining Company, is composed of timbers about the size of railroad ties, which are used in supporting the walls and roofs of the drifts and tunnels of the mines. A narrow-gauge railroad brings the logs, which have been sawed flat on two sides, to a point on the mountain slope about 600 feet above the valley, and they are then thrown into a wooden chute about four feet wide and two feet deep. The inside surface is kept smooth and slippery by a small stream of water. If the logs were allowed to run directly to the ground, they would speedily excavate an enormous hole besides damaging themselves, so the lower end of the chute is curved upward, and the logs leave it at an angle of about 60° with the horizontal and rise from 150 to 200 feet in the air, turning over and over, and finally landing on the enormous pile already there. A useful fact in connection with this method is that the logs sort themselves in the pile according to their size; the heavier ones, having a greater momentum, are all found at the side farthest away from the chute.

ESMERALDA CO., NEV., will have a little stir, by reason of a deal made this week, which involves about $2,000,000. Since the days of the Northern Belle the accumulated tailings have been a mass of unrealized wealth. The Holmes Mining Co. has contracted with an English company, disposing of about 400,000 tons of those tailings for fifty cents per ton, and to deliver about 700,000 tons low grade ore at the rate of $3.50 per ton for all ores whose assay value is fifteen ounces per ton. Ores running between fifteen and twenty ounces, worked by the English Co., are to pay the Holmes Co. twenty-five per cent of the battery assay value. All ore assaying above twenty ounces per ton is reserved by the Holmes Co., to be worked at the Candelaria mill. The English Co. will "clean up" the Belleville and Candelaria mills, receiving therefor forty-five per cent of the result. The latter is to begin within thirty days, and the proposed plant for working the tailings is to be in operation within four months from date. All settlements are to be monthly. It is estimated the erection of the plant for working the tailings will involve a preliminary expenditure of nearly $250,000.

Pocket Hunting in California.

NUMBER II.

Written for the MINING AND SCIENTIFIC PRESS by W. H. STORMS, M. E.

As the distribution of gold in veins of the pocket type is very irregular, those unacquainted with this class of gold mine would very naturally be led to inquire by what method the pocket hunter is enabled to discover his bonanza.

Pockets and pocket veins are found principally in two ways: By a systematic search known as "surfacing," and incidentally as the result of placer mining. Doubtless pockets have not infrequently been found by means of rich float quartz lying upon the surface almost in place, or at least not far removed from the original deposit, but these occurrences are more rare, and their discovery is the result of good fortune rather than anything else.

In the pocket mining regions of Mariposa and Tuolumne counties the prospector is not guided by any topographical feature or by any particular indication on the surface, unless, indeed, he be on the line of a well-known vein or series of pockets. His first venture is usually of the haphazard sort. He simply "goes prospecting" and selects a place where no one has been before and inaugurates a system of search. He usually chooses a slope, though the flats are not neglected. The method of investigation undertaken is called "surfacing." He begins by digging a series of small holes along the slope. These holes may be five or ten feet apart. The soil, rocks and other material taken from each hole is washed separately to determine the presence or absence of gold. Presuming that gold is found in some of these holes, it is usually noticed that those places showing gold are contiguous, while on the outer limits the soil tested shows little or no gold.

Having now determined the width of the gold-bearing hillside deposit at this particular level, the indefatigable prospector opens a second series of holes higher up the slope and immediately above the first. As a rule he finds more gold and he notes that the width of the gold-producing area is not so broad as at the lower series of holes. This is at once encouraging, and he hastens to make a third series of test holes still higher up the slope. As before, gold is found, but distributed across a narrower field than at the second series of holes. The gold-bearing area, as determined by the labors of the prospector, is assuming the form of the triangle with its apex pointing up the slope. Continuing the operation in the manner described, the pocket is at last found at the very apex of the pyramid, though possibly some distance below the surface under the loose soil imbedded in solid rock, or perhaps it may be found mingled with broken rock which has moved but little from its original position.

All observing persons have noticed that rocks rolling down a slope from a common point spread out in the shape of a fan, diverging more and more as the distance from the point of starting increases. Gold freed by nature from its matrix in the rocks distributes itself over a slope in exactly the same manner. The pocket hunter is well acquainted with this simple principle and an experienced prospector, after making two series of holes as described, can often locate very closely the source of the gold found in surfacing. Usually the gold is coarser near the pocket than at a distance from it; it also shows increasing roughness as the pocket is approached. All these indications are noted with care by the pocket hunter, and he acts in accordance with the indications.

A simple case with a successful termination has only been cited. The pursuit of the elusive "pocket" is not always so easy nor as successful as might be inferred. It is often a perplexing and discouraging task. Landslides of ancient origin; great depth of soil; interfering rock reefs which have influenced the direction of the float; the erosion of gulches and a score of other things combine at times to worry and defeat the prospector. A scarcity of water, which is not uncommon, only adds to the vicissitudes of pocket hunting. The several samples of dirt taken from the little holes on the hillside must be sacked and kept separate, and carried sometimes several miles to water, or down into a deep canyon, through high brush, over ragged rocks to a point where water can be obtained.

Considering all the drawbacks to pocket hunting, together with the uncertainty of the result, it is not hard to believe that pocket hunters must possess a most sanguine temperament.

A great many pocket veins have been discovered by placer miners, who have been led, foot by foot, directly to the source of the gold found in the gulches. The miner having worked his rich diggings up to a quartz vein and finding on passing it that the placer contains less gold or none at all, at once concludes that the source of his gulch gold is the quartz vein over which he has just passed.

Prospecting the vein quartz and finding no gold, his next conclusion is (basing his judgment on experience) that the pay is "spotted," or, in other words, a "pocket vein," for it not infrequently occurs that a bonanza is not at once discovered on the vein—those pockets which had supplied the gulch having been entirely eroded.

Then the experienced pocket hunter shows his skill. He begins a systematic search for "indications." He strips the vein, if it is not already well exposed, in search of a "crossing," the nature of which was described in a former paper on this subject. A "crossing" is a fissure, large or small, intersecting another vein at an angle. For instance, assuming the main vein to strike north, dipping 45° east, a fissure having a nearly east and west course and dipping anywhere from 45° to 90° either north or south and intersecting the main vein, would be called a "crossing."

It may be that the conditions at the surface are such that the miner does not consider it the best plan to open the vein longitudinally in search of a "crossing." His alternative is to sink a shaft on the vein in search of a "gold seam," which is the other essential for a regular pocket mine. A "gold seam" is also a fissure intersecting the main vein at any angle. It is usually small and has a strike nearly parallel with the vein. "Crossings" and "gold seams" do not conform to any rule as to their angles of intersection with the main vein, nor in their angles of dip. It is evident that a "crossing" striking west and standing perpendicular and intersecting a quartz vein striking north, dipping at any angle, will become a "gold seam" if the "crossing" assumes a dip approaching the horizontal; so they are simply relative terms, but the relation is not constant, the only requisite being that both the "crossing" and the "gold seam" shall intersect the main vein, and also that they shall intersect each other. It is at the point of intersection of these three planes, viz: the vein, the "crossing" and the "gold seam," that the bonanza is found, if found at all.

These seams are the guide to the pocket hunter in the majority of cases, but it appears that there are exceptions to this rule and that pockets do sometimes occur under other conditions.

About a mile from Big Oak Flat, in Tuolumne county, is a pocket mine known as the Silken. It has produced thousands of dollars from a small space, comparatively speaking. The pockets have all occurred within a well-defined area, in the form of a shoot thirty feet long and about four feet wide at the middle. This shoot pitches northward along the vein at an angle of 45°.

The vein strikes north, dipping west at about 40° near the surface, but becomes flatter with depth. It occurs in slates which strike east and west, dipping southward at 80°. The vein cuts directly across these slates. Along this vein "gold seams" running nearly parallel with it cut down from the hanging wall, making an intersection with the vein. The miner follows this line of intersection. "Crossings" are found parallel with the slates, cutting down through the vein and "gold seams," and deposits of gold are almost invariably found at the intersection of the three planes. These pockets range in value from $10 or $20 to several hundred dollars. The owner of this mine told me that he had averaged $150 a month ever since striking the pay shoot to which the pockets are confined. He worked alone most of the time, six days a week and about six or seven hours a day. The Silken is a distinct type of mines of the pocket class. It is not often, however, that the pockets occur within well-defined limits, as appears to be the case here.

There is another very interesting little mine not far from the Silken; on the same hill, in fact. It is known as the Ophir. It is rather an unusual deposit, but it has paid well for the small amount of work performed upon it. The Ophir mine is one mile northwest of Big Oak Flat. The vein, which is small, varying from a seam to two feet in thickness, lies nearly flat, intersecting slates which stand perpendicular, striking 15° west of north. The principal development on the mine at the time I saw it was a tunnel 170 feet in length, that had been driven on a fault which strikes across the slates at a low angle, but is also perpendicular. This slip, being younger than the flat quartz vein, has fractured it, that portion of the vein and the inclosing rock lying to the north of the slip having dropped down from one to three feet. It is in the mass of crushed slate and fragments of quartz lying between the fractured ends of the quartz veins that the gold has all been found. Over $4000 had been taken from this 170-foot tunnel in less than two months by two men. In addition to the coarse gold, obtained by pounding up the selected material in a hand mortar, considerable mill rock is also obtained which is worth over $100 a ton.

Bald mountain, near Sonora, in Tuolumne county, is a treasure vault of bonanzas. It has already produced hundreds of thousands of dollars and is still the scene of active mining operations. Most of the mines are of the pocket class. I had the opportunity of making an inspection of one of these mines near the base of the mountain near Shaw's Flat, known as the Louis Page mine, famous not only for its richness, but also for the great brilliancy and extreme beauty of the specimens of crystallized gold and telluride of gold and silver (petzite).

The Page fissure is from a seam to three feet in width and is usually accompanied by more or less quartz. It strikes northeasterly through metamorphic rocks of varying character and altered eruptives—diorite or diabase, diorite-porphyrite, black argillaceous slate and a sandy mica slate, hard, dense quartzite and felsitic dike rocks. A dike of light-colored rock of felsitic texture is found throughout all the workings of this mine. In places it is not over an inch wide; in others it has a width of several feet. It sends numerous branches off into the slaty rock of the walls. In some instances good-sized nuggets of gold have been found attached to the dike rock. A dike rock of similar appearance was found in this mine occupying a horizontal position. It appeared to have no influence on the gold. All of these dikes are older than the fissure in which the gold occurs, as the crevice frequently intersects the dikes and displaces them.

As usual, the gold in this mine occurs at the intersection of "crossings," "gold seams" and the vein proper, either in the quartz or in the wall rock near the intersection. The best results, I was informed, were found where the "gold seams" were nearly horizontal and just at the point where a nearly vertical "crossing" intersected both vein and "gold seam". There have been exceptions, I am told, in this mine, as gold has been found at the intersection of a "crossing" and the main vein. On the other hand, all of the necessary conditions—vein, "crossing" and "gold seam"—have been found, but no gold. What the real cause for this is no one has yet been able to satisfactorily determine.

This mine has a record of production exceeding $165,000. The lessees who were operating the mine at the time of my visit had been engaged for more than two years in driving the lower tunnel into the vein through rock which sometimes cost nearly $100 a foot. They simply demonstrate what has already been said—that it requires a sanguine man to make a successful pocket miner.

The Saratoga mine, a mile north of Sonora, is also a pocket mine with a record of production exceeding $100,000. The vein, from two inches to four feet in width, strikes north 50° east, dipping 70° northwest. It is a simple fissure cutting the formation, slates, quartzite, limestone and older dikes. The strike of this formation is north 25° west with a dip to the northeastward. Although this fissure cuts several varieties of argillaceous quartzose, magnesian and calcareous rocks, no gold is found in the vein adjacent to any of them except the black argillites. Accompanying the vein is a dike of felsitic rock.

The fissure is also a plane of displacement. The successive formations of the footwall side are found repeated in their respective order on the hanging-wall side thirty feet distant to the southwestward. It appears to be an example of the "thrust" type of faulting. The walls of the fissure are deeply striated in places.

All the gold thus far found in this vein has been at the intersection of "gold seams" and "crossings," but then only when the crossings occur in the slates. In this respect the Saratoga mine resembles the Bonanza.

The mines thus far described are all in Tuolumne county and for most part are similar, and exemplify to a nicety the theory of the pocket hunter that gold occurs at the intersection of three planes, one of which is the quartz vein. Similar mines occur in Mariposa county. There is a belt of pocket mines running through that county which are somewhat different in character, and will be described in another article.

Does Repeated Vibration of Iron and Steel Change their Molecular Structure and Produce Rupture?

In an article by Mr. Rickard upon "The Limitations of the Stamp Mill," which appeared in these columns some time ago, the statement was made that "vibration under all conditions will crystallize iron." This statement was criticised and as a result of the criticism a very interesting discussion has been running in the *Transactions of the American Institute of Mining Engineers*, a portion of the discussion having been published in Volume XXIII, page 143, and 557, while a continuation of the most interesting part of the same will appear in the Vol. XXIV which will be published in about three months. This subject is of interest to engineers. The following summary of the discussion is from advance pages of the *Transactions*:

Mr. Philip Argall holds that intense vibration under any condition will eventually crystallize iron and holds that such crystallization is simply a question of time. While admitting that the authorities differ upon the possibility of cold crystallization of iron, he believes it to be a settled and undisputed fact that vibration in the presence of heat will crystallize iron, quoting in support of the latter proposition Messrs. Blaxam & Huntington, Hall & Howe, quoting also in support of the former opinion the opinion generally prevailing in many text books and writings upon the subject.

He also cited some experiments and conclusions of

(Continued on page 172.)

Electrical Progress.

Notable Discovery in Electricity.

The year 1894 was not remarkable for epoch-making discoveries in science, but was busily occupied in the prosecution of familiar lines of research, with useful applications of existing knowledge as the chief result. Nevertheless something has been done to widen the intellectual vision and stimulate thought in new directions. Perhaps the most striking original work of the past year was Philipp Lenard's application in England of Hertz's discovery that metallic films are transparent to the dark rays issuing from the negative pole in the case of electric discharge in a high vacuum. Mr. Lenard closed one end of a vacuum tube with an aluminum film thick enough to resist atmospheric pressure and studied the rays after passage through the metal. The air outside was seen to glow faintly. All the ordinary phosphorescent effects produced by Crookes in a vacuum were thus readily produced in air. These rays from the negative pole, though not affecting the eye and producing no sensation in the skin, are yet photographically active, and to the tongue and nostrils have the taste and smell of ozone.

Unlike the rays of ordinary light, they cannot pass through quartz plates, but do not pass through metal films which are opaque to light. In respect to air or gas their behavior is equally novel. Ordinary light passes through a gas as if it were a homogeneous medium and becomes dispersed or makes its path visible only in case there are solid particles, such as dust, floating in the gas. But these rays from the negative pole, or "cathode rays," affect the gas molecules as if they were solid particles floating in a continuous medium. In other words, all gases, however transparent to ordinary light, are turpid to cathode rays, and the degree of turpidity depends wholly upon the density or mass of the gas molecules present, irrespective of their chemical character. Oxygen, for example, under a reduced pressure that brings it to the density of hydrogen, is as transparent as hydrogen, while hydrogen, if brought by pressure to the density of oxygen, becomes as turpid as oxygen.

The cathode rays traverse a perfect vacuum with facility. After passing through the aluminum screen their radiation in air stops at a distance of eight-tenths of an inch, but in hydrogen it extends to four inches and in a vacuum to fifty-two inches. While the rarest gas disperses the cathode ray into a blur, as a fog disperses an ordinary ray, its movement in a vacuum is in a straight line. But a magnet brought near deflects it. The question of the nature of matter is raised by some of Mr. Lenard's experiments, the experimenter being of opinion that the fact that every gas molecule acts as a solid obstacle to the passage of the cathode rays is a proof that the molecule is only "a function of the ether itself"—virtually that there is no matter, unless the name can be given to ether, a substance that eludes all tests. Prof. J. J. Thompson, on the other hand, finding that the rate of propagation of these phosphorescence-producing cathode rays is much less than that of ordinary light, but about one hundred times as great as that of the hydrogen molecule, solves the difficulty by assuming that electrified gaseous molecules, rather than the ether, are the seat of this mysterious force.

A practical utilization of the cathode rays has been in the Ebert luminescent lamp. The inventor states that a serviceable light can be obtained by means of his lamp with an expenditure of one-two-thousandth part of the energy consumed in the acetate unit lamp. Just what weight is to be given to his claim is in doubt, but it is evident that we have in Hertz's discovery and Ebert's lamp a promise of a new method of electric lighting vastly cheaper than those with which we are at present familiar.

It is stated that two new companies, in addition to the one now deriving power from Niagara Falls, will put in plants there, and will furnish power to industrial establishments in Buffalo. Prices as low as $2 or $3 per year per horse power are talked of by one company, which already controls a canal from which power for a number of factories is derived, the waste water falling over the cliffs. It is expected that by simply fixing pen stocks to the face of the cliffs, placing water wheels at the bottom and turning this waste into them, about 30,000-horse power will be available.—American Machinist.

THE operators of the Bakersfield electric light plant are experiencing no little annoyance of late by the soft wires between the commutator and armature burning out. Sometimes they do not last more than one night. Up till recently nothing of the kind had happened for four years. No satisfactory reason for it can be found. Information from various places says that similar trouble is occurring to other plants.

MAJOR JEWETT, of Buffalo, in a speech at a recent banquet, said that among other delightful things which Niagara will do for Buffalo are: Shovel snow, wind the clocks, run mother's sewing machine, bathe baby, pound beefsteak, feed the canary, cut the grass, boil eggs and take a hand at whist.

ACCORDING to the daily press, L. C. Pressley, of this city, has developed a device for "producing electricity direct from heat." Turn off the heat: turn on the light.

Coating for Iron Pipes.

The best coating for iron pipes that can stand the heat at 250° or more is made with a good asphalt lacquer laid on thinly. In order to tint this, an oxide in pulverized form of any metal is added; for instance, if good zinc or white tin is mixed with the asphalt it gives a gray shade, while red lead gives a brownish tint. If the asphalt is laid on thinly and "tin bronze" (the well known white bronze in the form of powder) is lightly dusted over it, it gives a coating of very pretty shade. A cheap and durable coating for steam pipes made of iron is somewhat difficult to find, especially if the coating is designed to protect the pipe against rust. It is difficult to put a durable coating on surfaces that have to withstand great changes of temperature, but in this case, when rust of the pipes is to be feared, it would be better to refrain from painting the pipes at all, and to zinc them instead. When they are covered with zinc, the fine pores of the iron are completely closed, which is not the case with painting. A good zincing of the pipes half way up also gives a pretty steel-like gray tint. To produce a red color the pipes, after being zinced, could be coated with some lead paint. If it is not considered advisable to use a zinc bath, a coating of red lead or zinc powder oil and seccative can be used instead. But however good these may be, they would not be successful in the case referred to in the question. If any oil paint should be used, care should be taken that this adheres properly to the metallic iron surface; consequently a thorough cleansing is necessary. If the red lead or vermillion referred to is employed, care must be taken that it is not adulterated. The good genuine red lead (Paris red) is a mixture of super oxide of lead with litharge and not with the ordinary iron vermillion (English lead); the latter consists of oxide of iron and peels off far more easily than the first-mentioned color. To hinder the peeling a light coating of lacquer is, in several cases, brushed over the paint, but this, of course, increases the expense of the operation.

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IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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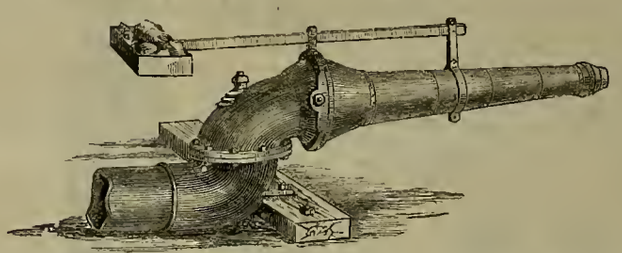
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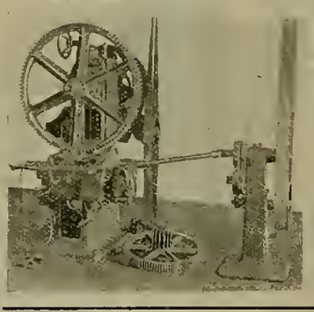
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Hydraulic, Irrigation and Power Plants, Well Pipe, Etc., all sizes.
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Iron cut, punched and formed, for making pipe on ground where required. All kinds of Tools supplied for making Pipe. Estimates given when required. Are prepared for coating all sizes of Pipes with a composition of Coal Tar and Asphaltum.

Drainage of Mines.

TO THE EDITOR:—I am pleased to see that this, the most important operation in mining, is now receiving the attention it has so long deserved, and that great efforts are being made in various ways to reduce the weight of the old-style Cornish pumping engines, which is not at all surprising when we consider the huge weights which are kept almost constantly in motion in order to effect the drainage of mines, the moving parts weighing all the way from 50 to 400 tons. In the direct single-acting Cornish engine there is not the same objection to this enormous weight as there is in the rotary engine, as the inertia of the rod and engine on the change of the down to the up-stroke is effected without loss of power by the compression of the steam between the piston and the cylinder end, the compressed steam being utilized to overcome the inertia at the commencement of the up-stroke, which accounts in a very great measure for its superiority in point of economy over the old-style rotary engine, although inferior to the modern rotary pumping engine.

It is evident enough that the loss of power in reversing the motion from the down to the up-stroke in the rotary engine, when running fast especially, is very considerable, and that the greater the weight of the machinery in motion the greater is the loss of power, and it has appeared to me for several years that there was a good opportunity for some one to reduce what in this enlightened age appears, to mine owners especially, the outrageous weight of these engines, and especially so where freight and fuel is high, and I have no doubt it will be interesting to every one engaged in mining operations to learn that I have succeeded in reducing it seventy per cent, and instead of a rod, weighing, say 150 tons, traveling at the rate of two miles an hour, my rod is only forty-five tons weight to do the same work, and, besides, requires no balance bobs in the shaft, which is alone an immense saving; some of the deep mines using three or four, for which large, expensive excavations have to be made in the side of the shaft, in addition to the cost of the bobs.

In order to overcome the inertia of this reduced weight, I have adopted a spring buffer similar in action to the steam buffer above mentioned in the Cornish engine, which takes effect in my rotary pumping engine just as it approaches the end of the down-stroke, whereby the effort to stop the rod at the end of the down-stroke is done by the spring instead of by the engine, and the spring relaxing as soon as the crank turns center exerts itself to overcome the inertia at the start of the up-stroke by which this loss of power is almost entirely overcome. This will appear all the more important when you consider it is repeated 20,000 times in twenty-four hours when the engine is going full speed. The buffer or buffers consist of a large area of vulcanite, and is adjusted by screws when in motion, and causes no jar whatever on the engine with a small fly-wheel on the crank-shaft. This engine is so constructed that it can be driven by electric power as well as with water or steam power, provision being made to allow the electric machinery to get into motion before the pumps are set in motion by means of a brake clutch, which dispenses with the difficulty hitherto experienced in starting the heavier kind of machinery with electric power.

This great reduction in the weight of the machinery is accomplished simply by adopting double-acting instead of single-acting pumps, and by an important modification in the construction of the rod. In the double-acting pump the column of water is only one-half the weight and size it would be if a single-acting pump was used, evidently, and hence a great relief to the valves and foundations of the pumps, and the rod of course only requires to be heavy enough to force the columns on the down-stroke and strong enough to lift them on the up-stroke. This extra strength is acquired by constructing the rod in the usual way, excepting that it is only one-third the weight, and two steel plates extend its whole length, so that I am not relying on the tensile strength of the wood but on the steel plates, which are twenty times stronger than wood, the latter being used only to give rigidity and weight to the rod, and thus avoiding the ordinary risk of breaking the wood rod, which has been a curse to mining from its infancy.

I use both a double-pole plunger pump with self-lubricating stuffing boxes and a double-acting piston plunger pump, provided with a self-lubricating piston and self-lubricating stuffing box. They are both provided with self-tightening stuffing boxes when they are liable to be submerged for any length of time. These stuffing boxes are also provided with bolts for tightening them in the usual way, which I hope will remove the prejudice existing in some quarters against the automatic gear. The plungers and the piston rod are guided in the centers of the stuffing boxes the same as the piston rod of a steam engine, and to compensate for the swelling of the ground and wood the guides are adjustable by screws, thus avoiding the cramping in the stuffing box attending the old style of wood guides without proper means of adjustment.

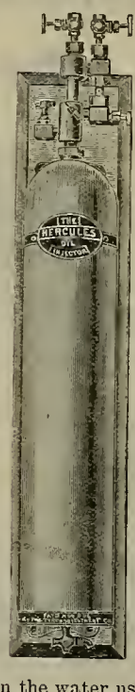
One would have thought that this great reduction in the weight, combined with a general improved condition all round, while retaining the valuable and generally approved features of the Cornish type, would have been sufficient to satisfy every one, for the time at least; but this is very far from being the case. Attempts are being made to do away with transmission rod and motor on the surface both by electricity and compressed air derived from water power a great distance from the mines. Well, I have been mining all my life, and every attempt at dealing with large quantities of water with machinery down the mine has almost invariably resulted in its being sooner or later drowned, while with the Cornish system, however often the mine may fill with water, it will pump it out again.

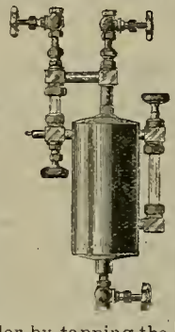
The greatest difficulty in mining is to keep the bottom of the shaft dry, so that you can sink, even with the most reliable machinery. It is obvious enough, I think, even to those who have never been down a mine, that every time the pump stops the water accumulates in the bottom of the mine, and no more sinking can be done until it is removed, and that if there are repeated stoppages very little or no sinking will be done; and the same thing retards all the operations in the bottom of the mine. In fact, the effective drainage of a mine is the life and soul of it, because it does not matter how rich the ledge may be, you cannot work it under water; and although I am a great admirer of electricity, I think it less adapted to the drainage of mines than any other purpose on account of the multiplicity and distribution of its parts when derived from water power a great distance from the mine. WM. NANCE.

Grass Valley, Cal.

Hercules Boiler Oil Injector.

The use of kerosene oil in boilers has heretofore been somewhat retarded by the inability to secure some device that would insure its entry into the boiler in quantities sufficiently minute to produce satisfactory result. The Hercules Boiler Oil Injector, herewith illustrated, feeds by the drop. It is easily attached to the feed water pipe anywhere between the pump or injector and boiler by tapping the feed water pipe and screwing in two one-fourth inch pipes, which are brought down to and connected with globe valves on machine. The injector must always be below the feed water pipe. These connections can be made between the pump and heater, if desired, and have the oil pass through heater, and also keep that free from incrustation. This is especially desirable with many kinds of heaters, as they are liable to get stopped up by scale. The injector is entirely automatic in operation. Once set for the number of drops per minute required (according to the amount and kind of mineral matter in the water used), it requires no further attention except to refill when empty. It is for sale in this city at the machinery depot of the Parke & Lacy Co., 21 & 23 Fremont St.





Wanted to Put It in Escrow.

One day this week the mining recorder of Trail Creek district was up at Rossland. He was approached by a Spokane capitalist, who would buy a mine, or the makings of one, if he could only get a miner's license without paying for it. Said he to the mining recorder: "Can't you issue a miner's license in blank, and leave it here with my friend, who will fill in my name and send it to me at Spokane if I should have occasion to use it?" "No," replied the mining recorder; "I am not issuing miner's licenses to be placed in escrow."—Rossland Miner.

"If a fellow attacked my opinions in print, would I reply? Not I," said Oliver Wendell Holmes. "Do you think I don't understand what my friend, the professor, long ago called the hydrostatic paradox of controversy? Don't know what that means? Well, I will tell you. You know that if you had a beut tube, one arm of which was of the size of a pipestem and the other big enough to hold the ocean, water would stand at the same height in one as in the other. Controversy equalizes fools and wise men in the same way, and the fools know it."—The Outlook.

Mr. McFadden's Exaggeration.

TO THE EDITOR:—When in Sonora some two weeks since, I saw an extract in your paper from some San Francisco daily, signed by one McFadden, in which he stated that he had recently been to Folsom and tried what he could make rocking for gold. He made 60 cents the first day, and, after being shown how, made $2 and $3 a day, and said that there was room there for hundreds of the unemployed to do the same; and also mentioned that the water company charged so much for the water used. I have been looking for just such a chance through Calaveras and Tuolumne counties, and at the same time looking for work, and I was induced to make my way to Folsom by reading the above. When I arrived there I got acquainted with four placer miners who have been working all winter, and they told me they were not going to work at rocking any more, as they had only made thirty cents a day all winter. There is a large land grant here, called the Natoma grant, on which they were mining, and the Natoma Company rent out water from their ditch. So, finding out that a Mr. Silverhorn had charge of the water and would be likely to know if any one was making money at mining or not, I went and saw him. He had heard about what McFadden had said, and he immediately said it was false and could not be done, and he also told me of an old miner who was working there and could no longer make his grub. He said McFadden might have taken out what he did by cleaning up some old sluice-box or something of the kind. I understand there is one small company sluicing and making wages, while another near by are running behind. I have long thought that the days of the rocker are gone by, and only the hard times made me think of trying it, and these $2 or $3 a day diggings are not lying around loose.

Auburn, Cal., March 9, 1895. S. HORTON.

Personal.

W. G. DODD of the Union Iron Works has secured letters patent on his new ore crusher.

MR. A. F. MANNING has returned from Lewiston, Wyo., where he bought a promising mine.

A. N. PETERSON, of Sutter Creek, has been engaged as millman for a ten-stamp mill near Mokelumne Hill.

T. A. RICKARD has resigned mine management at Rico Col., and resumes his work as consulting mining engineer in Denver.

SUPT. DAGGETT of the Mint has gone to Anspi, Sonora, Mexico, where he owns a gold mine which is about to be reopened.

E. T. HARRISON has been appointed Pacific coast agent of the Hannibal & St. Joseph and associated roads, with headquarters in this city.

COL. H. R. AYRES, resident manager for Fraser & Chalmers, Chicago, has returned home from an extended trip through the west half of North America.

L. A. PELTON, of this city, has been awarded the Elliott-Cresson medal by the Franklin Institute, for his improvements in tangential water wheels.

SUPERINTENDENT SHINN of the Hayward-Lane new gold mine at Silver Bow Basin, Juneau, Alaska, expects to return in about a month, taking the new thirty-stamp mill, referred to in last week's issue, up with him.

F. VON WEISSHUHN, a Berlin scientist, recently sent by the German Government to make an examination of the mineral resources of this country, is traversing Colorado on his journey westward. He expects to make an extended sojourn in this State.

HERBERT LANG, ore buyer for the Selby Smelting and Lead Company of San Francisco, is about to remove from Seattle to Spokane, Wash. The Selby Company is an extensive buyer in that section, its business last year amounting to about $2,000.000.

W. B. STOREY JR., recently connected with the Debris Commission, has been appointed engineer of the San Francisco and San Joaquin Valley railroad. He is a graduate of the State University and is a native of California. He was for a long time assistant to the chief engineer of the Southern Pacific.

DR. S. H. EMMONS has received $5000 from the United States Government for the use of his new explosive, known as emmanite, of which he is the inventor. This is not an out-and-out purchase of his right, but merely payment for a trial of the compound, to ascertain whether its adoption by the Government is advisable. If adopted, Mr. Emmons will secure a royalty on all used.

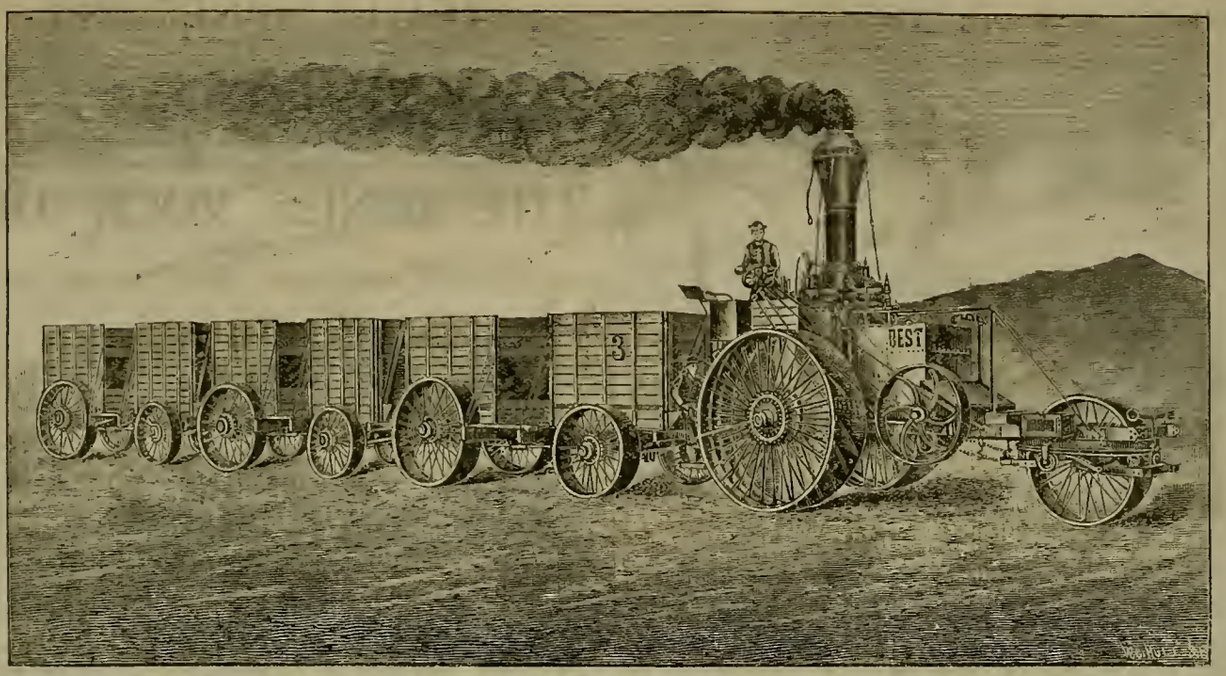
Obituary.

L. T. DAY, chief adjuster of the United States mint, died suddenly at his residence on the 12th inst., aged 46.

I. J. VAN ARSDALE, engineer of the Trihune mill at Golden, Okanogan county, Wash., was caught on a shaft in the mill last week and instantly killed.

FREDERICH E. SICKELS, aged 76 years, the inventor of the Corliss engine, died in Kansas City, Mo., on the 10th inst. from heart disease. Among his many inventions was the Sickels automatic trip steam cut-off.

AN ENOLISH PAPER contrasts the cost of a steamer of 3500 tons capacity built on the Clyde in December, 1889, with the cost at which such a boat may be purchased from the same builders at the present time. The former price was $157,500 against $107,500 at present. Machinery is the same in both cases—triple expansion, 22, 35 and 59 inches by 39 inches stroke.



STEAM FREIGHTING TRAIN.

ENGINE, 50-Horse Power. CAPACITY OF TRAIN, 50 to 65 tons; depends upon the roads.

MANUFACTURED BY

THE BEST MFG. CO., San Leandro, Cal., U. S. A.

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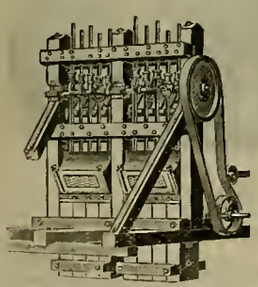
The Edward P. Allis Company, Milwaukee, Wis.

Established 1860. Reliance Works.



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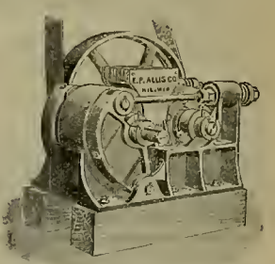

Reynolds Corliss Engines.

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The McGlew Ore Concentrator Company.

PATENTED SEPTEMBER 19, 1893. CHEAPEST, SIMPLEST, MOST DURABLE AND CLOSEST SAVING CONCENTRATOR IN USE. FRANK BARRERE, Secretary and Manager

Can be seen in operation at the Company's works, 132 Main Street, San Francisco.

Office, 116 Davis Street.

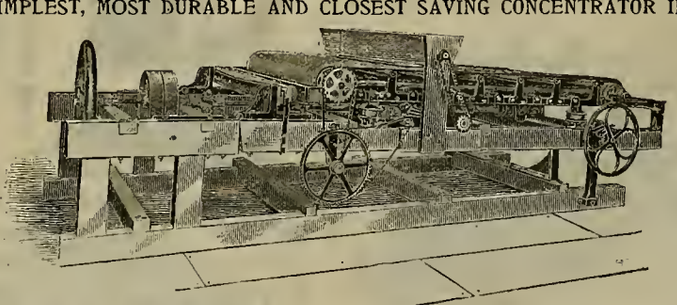
NINETY-FOUR AND ONE-HALF PER CENT
—SAVED—
ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness, combining both Side and End Motion with a Bumping Belt.

SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.

THE McGLEW CONCENTRATOR COMPANY: I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works.

The Gates Ore and Rock Breaker

Gives a finer product than any other crusher made, adding by this means 25 to 30% to the output of any mill, beside saving the wear of the more costly machinery. It will reduce a given amount of ore at one third the cost in wear of any other crusher on the market. It requires also much less power for the same amount of work.

The Gates Ore Crusher

Is now being adopted by the progressive Mining Companies in all parts of the world. More than 3000 of them now running.

The Pelton Water Wheel Company, General Western Agents

121 Main Street, San Francisco, Cal.

Scientific Progress.

Formation of the Rings of Wood in Trees.

The many differences of opinion that even eminent men are presumed to hold in regard to the character of the so-called annual rings of trees, would be readily reconciled if a little thought were given to the manner in which wood is formed as the trunk is enlarged. This is accomplished by the birth of new cells, which proceed laterally from the old ones. The new course of cells take their place around the mother cells, and form a thin layer over them, just as a sheet of writing paper might be wrapped around another. These in a few days again become mother cells, and another course is produced. This continues during the short time devoted to the growth, perhaps a dozen times, and the mass of new wood known as the new annual layer is really made up of a dozen fine layers so small that the concentric lines are only visible by means of a powerful microscope. Now the size of these cells depends on the amount of material at command.

The original mother cell that starts the annual growth has had the advantage of the best opportunities for stored nutrition; every successive addition is weaker and weaker, until the last growths of the season are very small. It is because they are so small and packed close together that we can readily see where they end, and thus detect the extent of the annual layer even in old trees. Now a tree may be in a position to have command over a superior stock of nutrition, and the cells are in a condition to avail themselves of the advantages, especially if the cells are naturally of a large size, as they are in some trees. In the European silver linden, for instance, the cells are one-fourth larger than they are in the common American linden; and in this and similar trees, a number of light rings can usually be traced in the annual increment. The same can often be seen in vigorous specimens of the cottonwood.

But plainly as these lines may be seen, the experienced investigator can rarely be mistaken on the last line made during the growing season, and is able to tell how many years the tree has been growing on the spot where it stands. There is nothing more certain than that in the hand of an expert the age of a tree can be determined by its annual growths.

ACETYLENE, the most powerful illuminant of the hydrocarbons, can now be produced on a commercial scale, says Prof. Lewes, in a paper read before the Society of Arts. It is a colorless gas with an intensely penetrating smell, resembling garlic, so that the smallest leakage would be quickly detected. Five cubic feet of gas will give a light equal to 240 candles for an hour. It is made by mixing forty parts by weight of finely ground chalk or lime with twenty-four parts by weight of any form of powdered carbon in an electric furnace and adding water. The product is lime and chalcic carbide, a pound of which will yield 5.3 cubic feet of acetyline. The carbide can be made for $20 a ton; the gas would cost about $1.60 a thousand feet, but its illuminating power would make its cost about equal to coal gas at twelve cents a thousand feet.

THE *Moniteur Industriel* records the fact that on the shores of Brittany, between St. Malo and St. Lunaire, in the vicinity of the St. Enogat station, at a place called Port Blanc, the tides have lately displaced a considerable amount of sand to a depth of nine to thirteen feet. Forests which have been buried for eighteen or twenty centuries have been thus brought to light, to the great astonishment of the seafaring people of the country. A great forest has in fact been discovered in process of transformation into coal. Ferns and the trunks and barks of trees are to be seen in an advanced state of decomposition. They are already beyond the peat stage, showing the films and flakes which are found in coal. Some of the trunks are sixteen feet in length, still very distinct, although becoming quickly transformed.

SOME PEOPLE insist that when an oak forest is cut down pines spring up, and that oak follows pine, and so forth; but this never occurs except where the two kinds are not far from each other. In localities where but one kind exists that kind succeeds itself. An intelligent Nevada correspondent notes that where the pine timber was cut away twenty years or so ago, fine young trees, apparently about fifteen years old, now cover the same area. They grow so slowly when young, she says, that few observe them, but after a few years they grow rapidly. It is about the sixth or seventh year before they start on the rapid growth.

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THE JONES ROCK DRILL

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Only Successful Hand Power Drilling Machine Ever Invented.

It is strong, durable, reliable, simple, compact, light, easily handled and operated by one man, and will reduce the cost of rock drilling at least Fifty per cent.

Our handsomely illustrated pocket catalogue fully explains the features and workings of the drill. It should be in the hands of every mine owner, leaser, contractor and prospector in the West. *Sent free on application.*

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WE CAN SAVE YOU MONEY.

FRANK T. SUTHERLAND, M'g'r Pacific Coast Agency.

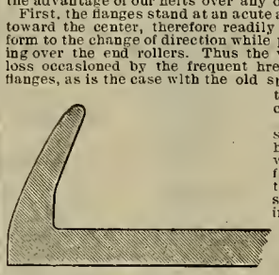
Office and Warerooms: 9 FREMONT St., San Francisco, Cal.

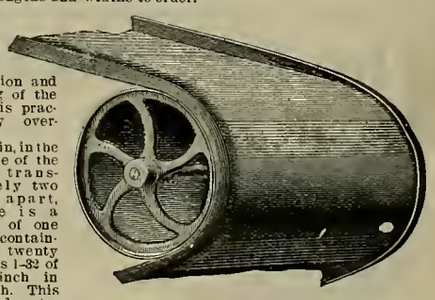
Or, Address the Company at its Denver Office.

Blasdel Improved Concentrating Belt.

We keep in stock belts suitable for the Frue, Triumph, Johnston and Tullock machines, and make all lengths and widths to order.

Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.





Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from hanking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

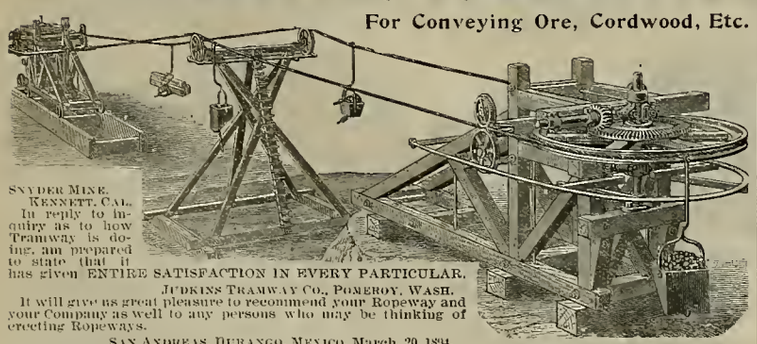
H. G. BLASDEL, JR., Manager,

419 California Street, Haywards Building.....San Francisco.

Stamp Mills!

VULCAN WIRE ROPEWAY

For Conveying Ore, Cordwood, Etc.



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In reply to inquiry as to how Tramway is doing, am prepared to state that it has given ENTIRE SATISFACTION IN EVERY PARTICULAR.
JUDKINS TRAMWAY CO., POMEROY, WASH.

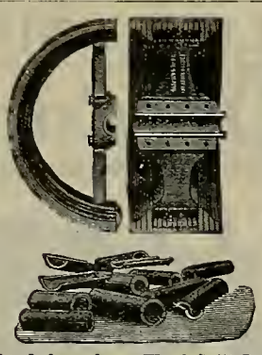
It will give us great pleasure to recommend your Ropeway and your Company as well to any persons who may be thinking of erecting Ropeways.
SAN ANDREAS, DURANGO, MEXICO, March, 20, 1894.

I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation.
ANTONIO H. PAREDES, Director S. A. de la S. M. Co.

Vulcan Iron Works,

135-145 Fremont St., San Francisco.

EVERY PULLEY GUARANTEED



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SIMONDS SAWS

AND MACHINE KNIVES.

RUBBER BELTING,

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LEATHER BELTING,

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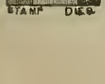

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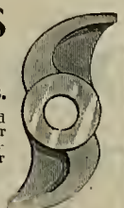

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"The amount of misinformation on the subject of aluminum makes me sick," says Mr. Leonard Waldo, a well-known engineer, to *Machinery*. Then he told of his experiences in casting aluminum bronze. His company has poured more of the stuff down holes than any other concern in the country. He showed a section out of a propeller wheel which was to have withstood a pressure of 60,000 pounds, but didn't. The fault could not be determined. One caster thought the metal was poured too hot, and another said it was poured too cold, and a third said it wasn't poured right. The fact was, Mr. Waldo said, that the way to success must be felt with aluminum as with everything else. "When the material is what it should be, and the work is done right, this metal is the king of bronzes. There is no other known material which will give the mechanical value that aluminum bronze will. It is possible to give it a strength of from 900 to 100,000 pounds to the square inch. "But," said Mr. Waldo, "I must put on record a protest against an alloy called aluminum alloy. With reference to this controversy as to whether it should be called aluminium or "aluminum," continued Mr. Waldo, "I will tell you what happened to me. I had the misfortune to deliver a lecture on the subject of this new metal. Right in front of me sat a bright boy of about high-school age, and his mother. Evidently they had had a dispute as to the proper word. As I proceeded I had occasion to refer to Sir Humphrey Davy, and, of course, I said aluminium. I saw the lady turn to the boy and smile. His face fell, as if he had met a bitter defeat. A little further on I used the word again, and this time, remembering that the directors of my company had, by a solemn vote, decided to call it aluminum, I called it aluminum. Now it was the boy's turn; he grinned and nudged his mother with evident satisfaction. In England it is aluminium. In America, by the act of the corporation which handles it, it is aluminum. I don't know how we shall decide the question except to leave it to popular taste."

An engineer remarks in an exchange that the grate bars under his boiler became warped and overheated, and consequently soon wore out. The steam requirements were very irregular, and the fireman, when demand ceased, opened the fire doors to keep the boilers from blowing off. This cut off the cooling draft through the bars, and the burning bed of coals superheated them. The difficulty was obviated by making a steam connection with other boilers used for other work, and allowing the fires to burn low at full dampers.

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Important If True.

A Springfield (O.) dispatch reports the invention by George Harley, a foundryman, of a process for making malleable iron of excellent quality direct from molds. A company has been incorporated with $1,000,000 capital. By Harley's process iron is made from an endless furnace with a peculiar method of controlling the admission of air, by which a thoroughly molten condition of iron is obtained. It is said that Bethlehem (Pa.) iron men have expressed a willingness to give $10,000,000 for the invention on proof that it is what it is claimed to be.

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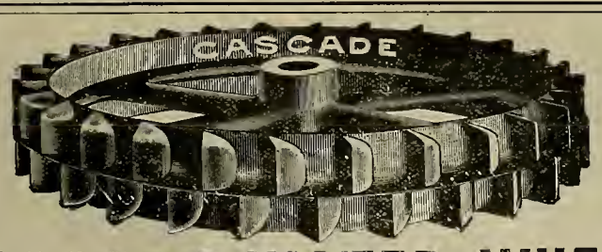
WATER  WHEEL

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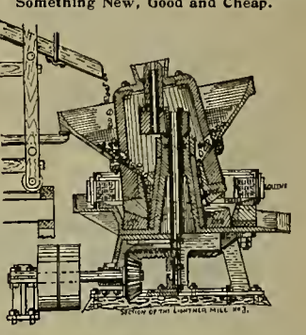

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

CHARLESTON DISTRICT.—*Record:* The old Acme mine may shortly start up. It was worked successfully twenty years ago. A hoisting engine and ten-stamp mill are on the property. It is thought that the company now taking hold of this mine will be rewarded for the money expended in opening it, providing the money and labor is economically used. The mine showed good indications of paying well when it was shut down in 1882. There are three different chutes of ore which are of high grade, and between each distinct chute is a mass of low-grade ore. The chutes dip away from the working shaft at an angle of about forty-five degrees, making it necessary for them to run through barren ground for a number of feet before reaching the pay ore. The last work done by the company was the sinking of one hundred feet and then cross-cutting a few hundred feet, and still driving the tunnel ahead. Then a difficulty arose between the superintendent and one of the engineers, which resulted in the wounding of the engineer by a shot fired by the superintendent. The latter was tried on a charge of attempt to commit murder, and the mine was shut down just as everything was ready to take out ore, all the dead work having been done.

The Excelsior mine is still working to its full capacity, the five-stamp mill being kept going night and day.

The Iron Mass mine, owned by A. A. Cline, is prospecting well. This is a new location recently discovered.

The Champion mine, owned by Messrs. Deneud and Linton, is reported as looking well. They have just put up a horse whim and sunk the shaft about fifty feet. They intend sinking fifty feet deeper before running the levels and stoping out the ore.

ONEIDA.—This mine has been idle for the last fifteen years. James D. Hague has been asked by Seligman Bros., of New York, to make a thorough investigation of the property. In face of the bonanza developments of the Kennedy on the south, and the promise of a good paying mine in the South Eureka on the north, it is the impression that he will recommend the starting up of the property.

THE ANITA — JACKSON DISTRICT. — *Ledger:* Sinking in the Anita mine is suspended, preparatory to putting in a steam pump.

ALPINE—PLYMOUTH DISTRICT.—Wm. Hooper has taken fifty tons of rock out of the Alpine mine, from near the surface, and will make a mill test of it at the Ivanhoe mill.

ALLISON—PLYMOUTH DISTRICT.—The Stockton people who have been mining in the Allison, have a shaft down fifty feet and have struck a rich chute of ore at about fifty feet.

MAHONEY—SUTTER CREEK.—Water is down at the Mahoney shaft about 750 feet. When the 800 level is reached Superintendent Ross will commence to drift south to strike the north drift from the 600 at the Wildman, to connect the two mines. Work has already been commenced on repairs at the Mahoney forty-stamp mill.

THE GWIN MINE.—The three-compartment shaft at the Gwin mine is some 600 feet deep and in hard gray rock, with but little water in the mine. They are sinking an average of fifty feet a week. About twenty men in all are employed.

BAY STATE — PLYMOUTH DISTRICT. — C. D. Lane and Hayward of the Utica have proposed to the owners of the Bay State mine that if given one-half of the stock of the company they will pay the debt of the property, put on ten more stamps and conduct the property without further assessment to the stockholders. The Plymouth stockholders do not take kindly to the proposition, as there seems to be no guarantee as to the length of time the property will be conducted by the Utica people.

THE ALMA—JACKSON DISTRICT. — The new hoist at the Alma works well.

THE LUCILE—PLYMOUTH DISTRICT. — Work was practically suspended about a week on account of foul air encountered as the water was lowered in the shaft and taken from the old works. A blower has been put in, pipes connected and work resumed. The water is down in the shaft about 400 feet.

Calaveras.

NOT SOLD.—*Echo:* Some time since we published (upon what we supposed to be good authority) that the Blair mine, near Smith's Flat, had been sold for a large sum of money. We have since learned that such is not the fact, and that the mine is still in the hands of the original owners.

TO FURNISH POWER.—A company is organizing in Chicago to install a large electrical power plant on the Stanislaus river, to furnish power for mining purposes in Angels Camp and vicinity. The company having the Angels mine in charge are instrumental in its organization.

MILL STARTED.—The mill at the Linderaxa mine was started this week. Work in the mine is progressing and ore is being extracted.

AN INCORRECT REPORT.—The report that the Debris Commissioners stopped the Central Hill Mining Company from mining is denied. The mine is reported in full swing, and will so continue.

THE BEATRICE MILL.—The Beatrice mill is running on quartz from the Oro Plata mine from the Hill shaft. The concentrates from the Beatrice mine are run through the mill again and over the concentrators preparatory to shipment. The mill is fitted up with all the latest improvements and has an electric light plant.

WATER GULCH MINE BONDED.—The Water Gulch mine, owned by Zwinge Bros., has been bonded to the company that bought the Leonard mine. Men are sinking a shaft and clearing ground for the buildings that are to be erected on Murray creek.

AROUND COPPEROPOLIS.—A gold strike near Copperopolis this week has started a good many prospecting in that section.

Kern.

RED ROCK MINING DISTRICT.—In 1859-60 hundreds of placer miners were rushing into what is now Kern county. This was the great southern rush. Following the placer miners came a set of bonanza quartz miners. These men built mills right and left, some on three and four-inch stringers of quartz and all on undeveloped veins.

As a natural result, with the exception of two mines—the St. John, 720 feet deep, and the Piute Mountain mine, 300 feet deep—that happened to be very rich from the grass roots down, the tide began to turn to some new strike.

Following these $10-per-day men came a set of $10-per-month men. One by one the mills were destroyed and the mines gutted out, as far as the ore could be got at without using timbers or powder.

Sageland, once a prosperous town of several hundred inhabitants, to-day has not one board standing—nothing to show that there had ever been a town there except a few cellars and the ruins of her three mills. Such was the history of the old Sageland mining district from 1866 to 1894.

In 1894 the discovery of placer gold was made at Red Rock on the Mojave desert, fifteen miles east of the old town of Sageland. With the rush to the placer mines came the quartz prospectors, who, finding no quartz mines in the placer field, turned their attention to the old Sageland district. One by one the old abandoned mines were opened up, and in nearly every instance the ledge had temporarily pinched or had run down in value to from $8 to $15 ore.

The former owners in 1860-66 had to haul supplies overland from San Pedro, 170 miles, and this, together with the lack of experience in quartz mining and poor machinery, made their enterprise unprofitable.

But to-day, with thirty-five years' experience and improved machinery, with cheap supplies, and with labor at the present rates per day, mining should pay well. As depth is attained, and the ground thoroughly explored, in all probability ore as rich as any of the surface will be found. Recently the prospectors have opened up over thirty promising claims, most of them new discoveries. The prospectors seldom have money enough to develop their finds, and therefore have to depend on outside capital for means to work their claims, and, as a general rule, they sell out for what they can get or abandon their claims undeveloped, saddle their burros and wander on, ever looking for "a poor man's mine"—that is, a mine rich enough to make expenses with a hand mortar or horse arrastra. These veins are fissures in granite and kindred rocks. They run from two inches to several feet in width, with wood and water reasonably near for milling purposes—all free-milling ore.

We, the prospectors, have done our part, and with this letter hang out our shingle, "Capital wanted."

The McMasters-McEwen Company have a group of ten old claims in Kelso valley. They have cleaned out the old tunnels and, in many instances, opened up new works. They estimate to have several thousand tons of from $10 to $20 ore in sight, and are making preparations to put in a mill by April.

Frank Hale has a force of men at work cleaning out the old Esperanza mine, an old-time producer and formerly one of the best mines in the district.

D. L. Applegate has leased his Gold Hill mine. It will be worked by water arrastras.

The Shoemaker mine, on Shoemaker mountain, shows a clean vein of from one to three feet, from which 112 samples, reduced down, assayed $14.47 per ton.

Mr. Moore, on Pinte mountain, has his twenty-seven-foot water arrastra finished, and will soon begin crushing. He has two claims, one of about eighteen inches and one of six feet, of $8 and $10 ore.

THE BUTTERBREAD SPRINGS GROUP.—Butterbread Springs is on the desert side and has plenty of water, but all timber will have to be hauled twelve miles. There are about fifteen promising locations within three miles of the springs.

The Mexican mine—R. N. Binford, owner—has closed down. I hear he refused $15,000 the other day for the mine, from San Francisco parties.

J. Artez and several others have uncovered a vein of from two to four feet, which assays $30 to $75 per ton.

Messrs. Howe and Rice will soon thoroughly prospect the Padre and Sixty-four mines.

The pioneer claim of the camp, the San Juan—J. Whitrock, owner—shows eight feet of ore that assays from $9 to $47. This claim is lying idle.

Mr. Benson's North Star shows four feet of low-grade ore. There are several claims joining the San Juan and North Star, but not enough work has been done on them to determine their value.

Near the Sixteen-mile House is the Harrelson ledge that averages sixty feet and assays $2.70 across the vein. This is the last claim on the mineral belt, and it is where the desert and mountains meet.

Mariposa.

DISTRICT ABOLISHED.—The miners of the Coulterville district have abolished that district, stating that the Quartzburg mining district was formed on June 25, 1851; on March 5, 1864, the Coulterville district was created from a portion of the Quartzburg district; the laws of the United States superseded the old regulations, making the district system obsolete and unnecessary; that no election for officers of the district had been held for years, and that the holders of claims had long disregarded the local district laws.

THE HITE MINE SOLD.—The Hite gold mine, twenty miles from Mariposa, has been bought for San Francisco and New York capitalists, for $100,000. It has a forty-stamp mill and free water power. On the 1st of next month a force of men will go to work.

Nevada.

QUARTZ MINING NEAR COLUMBIA HILL.—*Herald:* A good ledge of fine quartz has been struck in the claim adjoining the Grizzly Ridge mine, not far from Columbia Hill. Considerable prospecting has been done and the owners are satisfied that they have a good mine. All that is needed is to properly develop it.

The Live Oak mine, in the same vicinity, is looking well and some fine quartz is being taken out. The quartz-mining outlook is very promising in that section, and it is believed that there will be unusual activity there this summer.

Placer.

OPHIR.—The Gold Blossom at Ophir has made a strike. A body of galena sulphurets and gray copper has been struck in the east 180-foot level. Assays show the ore to be valuable.

THE North River hydraulic mine at Yankee Jim's is now running.

San Diego.

PADLOCK MINE.—Potter brothers and Cook, who recently purchased the Padlock mine at Julian, are hard at work developing their property and feel much encouraged over their prospects, says the *Sentinel*. They have opened up a good-sized ledge and are pretty confident there is money in sight for them. They have granted two leases on different parts of the mine, at which work will begin right away.

Sacramento.

AT FOLSOM.—The *Telegraph* says: "The McCue-Bates mine is now running in full blast and a large force of men is at present employed there, most of them working overtime. They are down about 100 feet—way below bedrock—where it is said that gold has been struck in such quantities as to be easily discernible among the gravel with the naked eye. The owners, and the community of Folsom generally, are well pleased with the outlook there, which no doubt will be a valuable acquisition to our town."

Sierra.

BALD MOUNTAIN.—The Bald Mountain Extension mine, at Forest City, has resumed operations, employing fifty men.

Trinity.

JUNCTION CITY PAYING PROPERTIES.—*Journal:* The Lorenz-Leihbrandt group of mines on Red Hill are showing well. On the 1st of this month a partial cleanup, the first of the year, yielded $6300, of which $3000 was a dividend to the owners, probably the first dividend from any placer mine in the county this year.

The mine is well equipped, and is supplied with all the water that can be used to advantage. Two giants are used and are running night and day. The bedrock ditch used in operating the mine is one of the deepest in the county—800 feet long, 15 feet deep at its upper end and about 140 feet deep at its outlet.

The Day & Begel mines and the Jacob Bros. mines, in that neighborhood, are also being worked.

The Hayes mine, now owned by the French Company, has a full complement of men at work, and a large amount of gravel is being moved.

Tuolumne.

EAST OF THE STANISLAUS.—Col. Dorsey, it is said, now has control of all the mines owned by him and Mr. Elliott, east of the Stanislaus river; and he is making preparations to work them. A mill is being erected. Good quartz is found in abundance on that side of the river, near the mill.

NEVADA.

ON THE COMSTOCK.—Condensed official reports say: 1650-foot level—On the sixth floor in the new ore body, at a point 125 feet north from the vertical winze which connects with the 1700 level, an east crosscut has been started and advanced 39 feet; in a quartz formation which assays from $6 to $10 per ton. On the twelfth floor the east crosscut has been advanced 40 feet; total length 65 feet; in low-grade quartz, the face being in porphyry. On the thirteenth floor, which is the fifteenth floor above the 1650 level, an opening has been made fifteen feet in length—north and south—showing ore four feet in width lying against the west wall and assaying on the average $30 per ton. From the south drift from the east crosscut from the main north lateral drift on the sill floor of this level, at a point twenty feet in from its mouth, we have stoped out to the height of fifteen feet along the west wall in ore which averages $40 per ton. 1750 level—The drift running south from the south end of the stope on the fourth floor has been extended twenty-five feet; in a porphyry and quartz formation which carries a low assay value. The ore extracted during the week came from the thirteenth floor above mentioned, and from the opening made from the south drift from the east crosscut on the sill floor of the 1650 level—amounting to 44 tons, which assayed, per mine car samples, $45.84 per ton.

Ophir—Quartz giving low assays is being cut in the openings 80 feet above the 1465-foot level. The same material is also being found in working south and upward from the 250-foot level in the old Central tunnel region, while north of the old Mexican shaft connection has been made between the winze and upraise spoken of in the last report, and quartz assaying $6 to $10 is being found.

Andes—Have cut out a station at the top of the upraise from the 420-foot level, and are preparing to start a west crosscut from the end of the south drift from the upraise at a point fifty feet up. The official letters from the other north-end mines are merely statements of the distances run while doing the usual exploratory work, and do not report any changes in the condition of these mines.

Hale & Norcross—No. 1 west crosscut on the 975-foot level has been stopped and a southeast drift started from its face, in porphyry. The south drift from No. 1 west crosscut is in 68 feet and is following a narrow streak of ore, yielding low assays. On the intermediate level, 30 feet below the 975 level, the small streak of ore in the south drift from the west crosscut continues the same as before reported. The north drift is in quartz and porphyry. During the week sixteen carloads of ore, averaging $41.60 per ton, were extracted.

Occidental Con.—The north drift from the west crosscut on the 500-foot level continues in ore of good quality, and the upraise from the end of the crosscut is showing ore of fair grade.

Alta—Northwest drift, 825-foot level, has not yet reached the footwall. The ore recently struck continues.

Sierra Nevada.—The south drift started at a point 193 feet from the mouth of the Layton tunnel is out a total distance of 198 feet; advanced 50 feet during the week; face in porphyry and quartz.

S. N., M. & U. Shaft.—The west crosscut from the Union Con., south lateral drift from the west drift, 1,520 feet west of shaft, 900 level, has been extended two feet during the week total length, 568 feet; face in a formation of clay and porphyry.

The east crosscut, No. 3, started from the Sierra Nevada north lateral drift, 600 feet north of the west drift, 1,520 feet west of shaft, on the 900 level, was advanced seventeen feet: total length, 180 feet; face in porphyry and clay.

Union Shaft.—The joint west crosscut from from the south lateral drift near the south line of the mine, 1,520 feet west of the shaft, 900-level, has been advanced twenty feet during the week; total length, 568 feet; face in a formation of clay, quartz and porphyry.

The joint east crosscut No. 3, from north lateral drift, 600 feet north of west drift, 1,520 feet west of shaft, 900-level, has been advanced seventeen feet; total length, 180 feet; face in porphyry and clay.

Challar.—The south drift on the eighth floor of the north stopes above the 550-level has been carried to a total length of fifty-one feet; advanced during the week fourteen feet; face in low-grade quartz assaying $8 to $15 per ton. Extracting the usual quantity of ore from the stope between the 450 and 550 levels, the yield for this week being 223 tons and 1,200 pounds, which has been shipped to the Mexican mill for reduction, the average battery sample of which was $29.28 per ton. On the 650 level the north drift has been cleaned out and repaired 130 feet during the week, or a total distance of 190 feet from the main west crosscut.

Potosi.—The south drift on the 550 level from the bottom of the 450 level winze is out fifty-four feet, thirty-two feet having been added during the week. It is following a narrow streak of ore, giving assays from $25 to $50 per ton. Have saved during the week twenty-two tons and 200 pounds of ore, car samples of which assay $35.20 per ton.

Bullion.—The west drift from the 820 level has been advanced during the week thirteen feet; total length, 1,408 feet; face in soft porphyry with a strong flow of water.

Alpha.—Have advanced the north lateral drift on the 450-foot level seventeen feet; total length, 192 feet; face in hard porphyry, with stringers of quartz through it. At a point 145 feet north of the main west drift have started a west crosscut; face in porphyry and quartz.

ALASKA.

AT SUM DUM BAY.—*News:* N. S. Trowbridge, superintendent of the Bald Eagle Mining Co. at Sum Dum bay, has commenced operations early this year, as he proposes to finish all construction work before the snow melts from the canyons and hills fronting Sanford Cove. He had eleven men with him, coming up from the Sound and San Francisco, and five others went down from here the first of the week to join the force. Among them were P. C. Plummer, John Mitchell and John Harris. He has started the men in building a mill, 30x60 feet, up the canyon about a mile from the beach, in which he will erect a four-stamp battery.

ARIZONA.

BIG SILVER STRIKE.—*Miner:* Report comes from White Hills that an immense body of ore has been encountered below the water level in the G. A. R. mine, owned by the White Hills Company. Samples from the vein run over 1100 ounces in silver and four ounces gold per ton. This is the first strike of ore that has been made below water level and proves that the mines go down.

TO BE UTILIZED.—The old El Rio ten-stamp quartz mill is being torn down to be shipped to a mine twenty miles south of Tucson. The purchasers will take the boiler, engine and stamps. The mill was put up by Childs & Gillespie of this city to work Cargo Muchaeho ore, but the venture was unprofitable owing to the expense of hauling the low grade ore to the railroad five miles. It has been idle for years.

AN UNBIASED OPINION.—E. M. Wade, a Los Angeles assayer, judges from a trip through Arizona that with more capital Arizona would be a great mining section.

Among other of the camps visited by Mr. Wade was the Washington, in the southern

part of Pima county, thirty miles from Nogales, a solid mountain of limestone cut up by veins of copper, silver and lead ores. For two miles this mass of limestone may be traced, all cut up by these interesting veins of valuable mineral. A Duquesne company began to mine, and has been succeeded by an Indiana company, and these people have put in concentrators by means of which 100 tons of ore per day are handled. Of course it is a low-grade proposition, but the supply appears inexhaustible. The assays have averaged twenty-eight ounces in silver, $3 in gold, and about eight per cent copper, with just enough zinc to make the ore somewhat refractory. One of the most promising locations is being negotiated for by Los Angeles parties, and if the purchase is consummated there will be a good return on the money invested, despite the fact that considerable money will have to be expended in a concentrating plant, in addition to which the concentrates will have to be smelted.

About forty miles southeast from Tucson, in the Santa Rita mountains, work is being carried on at the copper mines of L. J. Rose. The ore is very fine and all that has been the matter has been that it wasn't developed. As the property is opened up and the ore accumulations warrant the starting up of the $60,000 smelter erected, the outlays made will be more than recouped. At Greaterville, a small camp close by, there is some good placer ground that has yielded largely in the past, but Mexicans are now working the ground almost entirely, and there is little shipping ore being taken out by chloriders. Mr. Wade passed a month at the Glory mine, eighty miles southeast of Tueson, and which belongs to Capt. G. G. Mullens, Shirley Ward having a slight interest. The property is at present in the hands of a receiver, but the outlook is good and encouraging. A tunnel has been run in for about 400 feet, and a large body of low-grade ore uncovered which averages from $6 to $8 per ton, and which is a free milling proposition. The vein is about fifty feet in width and has a vertical dip of about sixty deg. Most of the ore in the vicinity is of a porphyritic character, but, rather strangely, in the Glory, while the formation is porphyry, the ore is mostly white quartz and exceedingly hard.

After an extensive trip through Arizona, Mr. Wade believes there would be little difficulty in getting the necessary capital for development purposes if the owners did not hold them at such extravagant figures. With a little more modesty in this direction the mining industry of Arizona would receive an impetus that would enrich the Territory.

SALE OF THE MAMMOTH.—Tombstone *Prospector:* Col. Zabriskie, of Tueson, who has about concluded, with his associate in New York, a sale of the Mammoth gold properties, returned a few days since from the East. The sale which is about to take place includes the Mammoth as well as the Collins group, at Mammoth.

THE COPPER GLANCE.—*Prospector:* The machinery for the Copper Glance Mining Co. has nearly all arrived, and is being hauled to the mine and put in running order as rapidly as possible. A new force of men is to be employed, and the output of ore to be increased. The ore runs very high in silver and is 35 per cent copper.

MONTANA.

THE DRUM LUMMON MINE.—*Reporter:* R. T. Bayliss, superintendent and managing director of the Montana Mining Company, or the Drum Lummon mine, was recently in London, where he presented a circular letter to the stockholders explaining why the sixty-stamp mill stopped work last February. The mill was erected specially for the treatment of low-grade ores. It was decided that in order to keep this mill in operation it would be necessary to employ six additional machine drills in the extraction of ore from various parts of the mine. The mill, however, will remain closed down until they have accumulated enough low-grade ore to keep it in constant operation. The adoption of this policy will not affect the regular monthly profit now being earned at the mine, as the grade of ore treated in the fifty-stamp mill will be of higher value, and the directors are advised that this arrangement is fully justified by the accumulation and increased value of the high grade ore developed during the past year.

NEW MEXICO.

A RICH STRIKE.—A rich strike is reported in the Lone Star mine, Cochiti district; eleven feet of paying ore has been encountered. From ten assays the rock averaged $50 in gold to the ton. Bland is the principal town of the district.

OREGON.

Josephine Co.

PLACER MINE SOLD.—T. H. Donovan has sold the Philips placer mine on Jump-Off-Joe district to Judge Smith of Portland. Pipe will be purchased and work begun at once.

SOUTH DAKOTA.

HOLY TERROR CLEAN-UP.—*Pioneer:* On Tuesday a clean-up was made from the company's ten-stamp mill which netted $8000. This is from a five days' run on ore from the shaft. Yesterday a lump of rock weighing sixty pounds was taken from the mine, pounded up and panned, resulting in a one thousand dollar clean up. The rock from which this result was obtained was taken out of a drift run from the one hundred-foot level. The owners have a bonanza, as it is reported that there is rich ore enough in sight to run the stamp mill continuously for ninety days.

UTAH.

SAN JUAN PLACERS.—Great placer mining activity is reported along the San Juan. Many miners are coming in and are making good wages with the crudest appliances. Water wheels suspended between boats, such as George Goss is putting in at the Good Hope bar on the Colorado, are being successfully operated. At a point eighty miles below Bluff the gravel is being transported some distance on pack animals and worked at a good profit.

MICA MINES.—Messrs. Rogers of Asotin and Lewiston have given a deed in escrow to Messrs. Hallett and Morrison for their mica mining claims in the Robinson mining district in Latah county. Work will be commenced at once.

THE IBEX IMPROVING.—*Tribune:* The members of the Ibex Mining & Smelting Company are feeling very jubilant over the recent developments at the mine. The ore bodies are said to be constantly improving, both in extent and value. A noteworthy feature is that the copper values are diminishing, and the gold values increasing. It is reported that a hanging wall has been encountered at a depth of 175 feet, indicting the mine to be a fissure vein instead of a number of chutes.

WASHINGTON.

MINING IN THE STATE.—The oldest gold mining district in Washington and the one from which most of that precious metal has been taken is the Swauk district in Kittitas county. From 75 to 100 miners have been actively engaged in taking out placer gold since 1873. They have shown disposition to keep from public knowledge of the amount, and they have worked in a crude way with pick and shovel, but some definite figures are now accessible.

The miners are protesting against the Northern Pacific Railroad Company's getting patents to lands in the district, and last week L. H. Jansen of Tacoma, manager of the Swauk Bedrock Flume Company, was in camp making out protests and affidavits of some of the miners as to the quantity of gold they have taken out of their claims.

John Black, in twelve years	$21,000
Thos. F. Meagher, it thirteen years	20,750
C. E. H. Bigney, in two years	12,500
T. Tweet, in three years	8,000
A. W. Johnson, in three years	8,000
C. A. Deilig, in one year	2,350
Total for the six men named	$72,600

Others have taken out quantities graduating down to $150 a year.

In talking of these figures, Mr. Jansen said: "During the three years I have been acquainted with the camp, I believe large sums in gold have been taken out by both American and Chinese miners of which I took no account and had no knowledge.

"The Swauk creek camp is reached by a six hours' trip from Seattle to Ellensburg with a journey of four hours by stage from that town. The creek and its tributaries are being worked for some nine or ten miles, but only in a crude way. We have the same kind of gravel as was taken from the blue gravel diggings in California and have the old blue gravel channel; I have myself brought out several thousand dollars of gold nuggets from the camp, among them some very large ones. All the work is sluicing except one hydraulic plant, but the flume company is preparing to work it systematically on a large scale.

"The company has secured six miles of the land along the line of the creek and has contracts on two miles more. It will build a flume four feet wide and thirty inches deep from the mouth of the creek up and will hydraulic the gravel with water from reservoirs and lateral streams with 250 to 300 feet pressure, and gradually extend the flume up the stream as the ground is washed out. There is no danger of damage to farms along the Yakima river at the mouth of the creek, as the river runs through canyons giving abundance of dump and the mines can be worked nine months in the year.

"Other streams parallel with Swauk creek are also being worked and all its tributaries have been well prospected. Williams creek has some of the finest miners in the State, and an old river channel runs up it. Boulder creek has some fine prospects, but has not been worked much. There are good quartz lodges in the vicinity, in fact you can see the quartz sticking to the gold, and prospecting is going on all through the neighboring mountains, but the men are too much in the slides, where the ledges have been broken up. Very little development has been done, for the parties in there have not the means. Still several quartz mines are being worked with arrastras, and one owned by Tweet & Johnson has paid $16,000 in a sixty-foot tunnel in the last three years."

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from A. Blair, in the American House Mine, near La Porte, Plumas Co., Cal., to impound tailings behind dams in the American House Ravine; from Jay E. Russell, in the Spring Tunnel and Spring Canyon Mines, near Mount Gregory, El Dorado Co., Cal., to impound tailings behind brush dams in Spring Canyon; from Porter Phillips, in the Mount Gregory Gold Mine, near Georgetown, El Dorado Co., Cal., to impound tailings behind brush and log dams in a ravine below the mine; from Wulff Bros., in the Deer Valley Mine, near Green Valley, El Dorado Co., Cal., to impound tailings in an old hydraulic pit; from John Enos, in the Strawberry Placer Mine, near Vallicita, Calaveras Co., Cal., to impound tailings behind rock dam in a gulch below the mine; from Geo. R. Evans et al., in the Red Hill and Telegraph Hill Mines, near Rancheria, Amador Co., Cal., to impound tailings behind log dam in Chill Gulch; and from Moy Jin Mun, in the Grizzly Hill Mine, near Volcano, Amador Co., Cal., to impound tailings behind brush dam in a ravine below the mine, gives notice that a meeting will be held at Room No. 12, Flood Building, San Francisco, Cal., on March 18th, 1895, at 1:30 P. M.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Geo. W. Edwards, in the Blacklock Mine, near Placerville, El Dorado Co., Cal., to impound tailings behind a brush dam in Spanish Ravine; from Kelly & Matherly, on Rattlesnake Bar, near Auburn, Placer Co., Cal., to deposit tailings on bank of American River; from O. M. Henry, in the Dry Gulch Mine, near Volcano, Amador Co., Cal., to deposit tailings behind a dam below the mine; from J. K. Williams, in the Saw Mill Flat Mine, near Whiskytown, Shasta Co., Cal., to deposit tailings in an old hydraulic pit; and from Thomas Ewing, in the Mooney Placer mine, near Placerville, El Dorado Co., Cal., to deposit tailings in old hydraulic pit, gives notice that a meeting will be held at Room No. 12, Flood Building, San Francisco, Cal., on April 1st, 1895, at 1:30 P. M.

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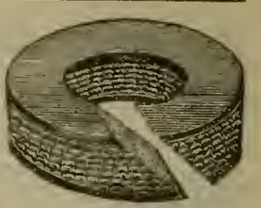

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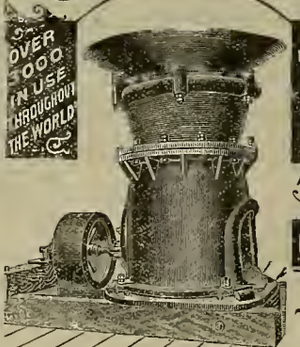

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Dr. Carl Barus to show tbat the molecular structure of iron can and does change under different physical conditions and at atmospheric temperatures.

A number of cases are also cited by Mr. Argall and others of broken stamp stems and other iron bars which undoubtedly show crystallization, but in this connection it may be noted that the point of discussion is not "do the fractures show crystallization?" which is disputed by no one, but "is such a structure due to continued vibration and not inherent in the iron or merely due to to the method of rupture?"

Upon the negative side of the discussion are Dr. R. Raymond, Mr. H. M. Horn, Prof. A. Ledebur, Mr. M. Osmond and others, some of whom state positively that vibration does not produce crystallization, while others simply hold that the present evidence does not prove the positive proposition.

Dr. John Percy said many years ago:

"I have not met with any evidence to justify an affirmative answer, as to whether vibration, caused by impact or otherwise, may induce a crystalline arrangement, which did not previously exist, or was only imperfectly developed."

Prof. A. Ledebur (Handbuch der eisen hutten kunde, part III, 1894) says: "The opinion that a fracture caused by repeated strains is the result of a change in structure, and particularly that fibrous wrought iron is transformed into grannlar under continuous shocks, has proved to be entirely erroneous."

Numerous experiments instituted by Badchinger, in Munich, in which bars of iron and steel were submitted to repeated shocks, led him to the conclusion that "strains of iron and steel repeated frequently millions of times bring about no change of structure."

Two very suggestive experiments are cited by Messrs. Ledoux & Durfee, by which a bar of wrought iron may be made to show in two fractures only a few inches apart two distinct sources of fracture, the one sharply crystalline, the other fibrous, dependent simply upon whether breaking force has been a sharp blow or a slowly applied load.

In the *Iron Age* of July 15th. and September 27th, 1894, Mr. Kreuzpointner, of Altoona, Pa., sums up the present status of knowledge on the subject, as drawn from his own investigations and a study of the leading authorities, both American and foreign:

1.—Crystalline appearance on the fracture is caused by the manner of breaking, i. e., transversly broken fibres show granular crystalline faces, but when pulled apart longitudinally, the same iron will show a fibrous structure.

2.—The iron in a bar may be crystalline at one point, but fibrous at another.

3.—Iron may have been crystalline at the point tested, but assume a fibrous appearance at the tensile fracture, due to the flow of metals.

4.—Changes in the component elements of iron are necessary for changes in its crystallization, and these changes cannot occur at low temperatures.

5.—Repeated stresses cannot produce caystallization.

Wohler & Spangenburg agree that alternate and intermittent stresses tend to deteriorate and fatigue metals.

Mr. Howe sums up as follows:

"Repetitious of stress, wholly unaccompanied by shock and vibration, are well known to induce some kind of deterioration, which eventually breaks iron. Vibration and shock, unaccompanied by great stress, or at least by prolonged repetition of considerable stress, has never, so far as I know, been known to break it. Examination of the fragments of pieces thus broken by repeated stress, even when accompanied by vibration and shock, has indicated that the injury was local, and careful microscopic examination of the fragments close to the fracture has detected no crystalline change, but at most a shattering and incipient separation of the pre-existing crystals, particles or grains, or whatever you may call them."

Mr. F. Osmond, a French authority on iron and steel, says: "I know of no fact which demonstrates the crystallization of iron by vibration; and all that I do know is opposed to that opinion The aspect of the fracture depends upon the original quality of the iron and the mode of rupture."

Dr. Raymond proposes that the following series of tests be made, which go far to satisfactorily settle many of the points now in dispute:

1.—Examine a stamp stem, which has been running a long time without breaking, for fracture and structure.

2.—Compare such a stem with one made at the same time from the same metal, but never used.

3.—Examine a broken stem at other points than the point of fracture.

4.—Test such a stem at any point in it and see if it is not possible to produce at will either granular or fibrous structure by simply varying the mode of fracture.

5.—Test any stamp stem, new or old, as in 4, and see if the metal acts differently from other metals.

By an act of Congress, approved Dec. 13, 1894, all land warrants, Surveyor-General's scrip issued under the act of June 2, 1858, is receivable, without fees, at any U. S. land office at the rate of $1.25 per acre, in payment for commuted homesteads. desert entries, timber and stone entries, and timber-culture entries, and land purchased at public auction, unless the land was purchased from an Indian tribe within ten years.

Consumption of Wood on the Comstock.

William Alvord. of this city, prepared a paper on the consumption of timber and wood in those mines for the meeting of the American Forestry Association in 1891, but the paper has never been published in its entirety. Some extracts from the paper are herewith given, it being observed that the statements are applicable to the date when the article was written.

The walls, ore bodies, and, generally speaking, the entire formation of this lode, are remarkable for want of firmness and tenacity. The friable nature of the ore, which renders its mining comparatively easy without blasting, except to fracture large masses, has a counter disadvantage in requiring an expensive and complete system of timbering in order to make its extraction safe. Again, some of the mines of this lode are. or have been, operated at a depth considerably exceeding 3000 feet. However, the chief reason for using large quantities of timber is the great width of veins carrying high-grade ore. On the 1550 level of the Consolidated Virginia mine a vein 330 feet wide has been worked out clean, and in it and various other mines of the lode veins ranging from 65 to 200 feet wide have been worked out in the same manner. The ore of the vein in the Consolidated Virginia, above referred to, furnished an average yield of $126 in silver and gold to the ton. Such ore is too valuable to be utilized for chamber walls as principal supports, as is done in most of the mines of the world.

The enormous pressure resulting from the weight of the overlying formation, augmented by the absence of the usual chamber walls as principal supports, is sustained by an elaborate network of costly timbering, which has been admired for its completeness, safety and structural strength by many of the most skillful mining engineers of the civilized world. Without vast quantities of massive timbers to keep the walls in place, and corresponding quantities of wood to generate power for pumping out the water, hoisting the ores, reducing and amalgamating them and retorting at the mills, the great bulk of the precious metals which the Comstock mines have poured into the lap of nations would never have been discovered, and its extraction would have been practically impossible. The constant requisitions of the Comstock mines upon the mountain forests have led to the christening of the lode as "The Tomb of the Sierras."

When the mines of the Comstock lode were discovered the surrounding mountains were sparsely covered with a growth of scrubby pines (*Pinus edulis*), commonly known as the Pinon or nut pine, interspersed with a stunted variety of red cedar (*Juniperus Virginiana*). These woods were the most valuable of all for fuel, being hard, resinous and fine grained, but were worthless for timbers and lumber, being too small. They supplied the wants of the mines during the prospecting and surface-mining eras, and as long as fuel only was wanted, but as soon as any considerable depth was reached the supply was entirely exhausted, and the most easily accessible forests of the eastern slope of the Sierra Nevada were encroached upon, and ever since then the forest line of these mountains has been pushed westward before the axe, until now it is west of the eastern crest of the Sierra range, and almost on a line parallel with the western shore of Lake Tahoe, and fairly within the limits of the State of California.

Timbers, lumber and wood have been chiefly supplied in late years to the Comstock mines from the southern portion of the Lake Tahoe basin, on the California side of the State line. The wood and logs are first transported about twelve miles by rail to the lake shore at Bijou, the railroad extending over piles 1790 feet out into the lake, to a depth of water where the steamers and barges can moor alongside of the track. The wood is unloaded from the cars on barges, which have a carrying capacity of from 75 to 140 cords each. The logs are dumped from the cars into the lake and enclosed in boom timbers, forming immense rafts, and then towed by powerful steamers to the eastern shore of the lake. At this point the logs are sawed into timbers and lumber, which, with the firewood, are reloaded on cars and transported up a long incline to the summit over another railroad about ten miles long. At the summit it is unloaded and is conveyed through a flume about twelve miles to the wood and lumber yards at Carson City, Nevada, and from there it is taken by rail twenty miles to the mines, making a total distance of sixty-five miles from the forest, over two rugged mountain chains. From the forest to the mines the timber, lumber and wood are necessarily handled thirteen times, but the arrangements are so methodical and complete that the whole system is operated with mechanical regularity and precision. The flume is V-shaped, with a carrying capacity of 600 cords of wood a day, and it will transport the heaviest mining timbers as well as lumber and cord wood.

To the present time 120,000 acres of the Sierra Nevada's choicest forests around Lake Tahoe, and 75,000 acres around the headwaters of the Carson river, have been denuded to operate the mines. This area was practically all heavily timbered, and when it is considered that it equals an expanse of land 305 miles long by one mile wide, it will be apprehended that there is good reason for calling the Comstock "The Tomb of the Sierras."

From January 1, 1880, to January 1, 1891, 249,756,000 feet of timber and lumber were shipped to and used in and about the Comstock mines. During the same period 100,776,440 cubic feet of wood were consumed, and to the latter amount should be added 11,224,000 feet consumed by the Carson river mills, auxiliary to the mines, making a total of 875,316 cords. For the decade commencing January 1, 1870, and ending January 1, 1880, the timber, lumber and wood used cannot be ascertained with exactness, but a conservative estimate by men most familiar with the facts fixes the figures at 425,000,000 feet of timber and lumber, and 268,800,000 cubic feet of wood, to which should be added 10,240,000 cubic feet used in and about Carson river mills.

A moderate estimate of the average price paid at the mines for timber and lumber since 1870 is $23 a thousand feet and for wood $10 a cord, so that the Comstock mines since 1870 have used wood and timber to the total value of $46,072,548.

The consumption of forest products by the mines for the period between the discovery of the Comstock lode and 1870 can hardly be approximated, as there are no data for that time obtainable, but $55,000,000 is probably a moderate estimate of the entire cost of timbers, lumber and wood used in and about the Comstock mines from the date of their discovery until the present time.

The seemingly endless labyrinths of timbers in the Comstock mines, when ignited and beyond control, make a subterranean fire which burns and smoulders for years. Many lives have been lost in the mines by reason of these fires, but none are recorded as having been lost because of any inherent defect in the timbers or system of timbering. The size of the timbers used varies from the huge pieces sixteen inches square and twenty-four feet long to the smaller pieces eight inches square used in cribbing. The species used are chiefly yellow pine (*Pinus ponderosa*), fir (*Picea magnifica*) and cedar (*Thuya gigantea*), of which the latter is found in such small quantities as to be hardly worth considering. Fully two-thirds of the whole amount used is yellow pine, about one-third fir, and less than one per cent is cedar. Yellow pine is a favorite timber with mine carpenters, on account of its exactitude in joining. Cedar is inferior to no known timber, not even excepting redwood, for its lasting qualities underground. Yellow pine has been taken from the lower levels of these mines so compacted by the enormous pressure it has withstood as to have a density and weight exceeding those of lignum-vitæ, and has been made into paper weights and other beautiful ornaments. None of the timbers in the Comstock mines have yet badly decayed, and their life there cannot be accurately determined. The heat and vapors of the mines surcharged with mineral atoms appear to have a decidedly preservative effect upon the timbers.

The area upon which the forest has been cut off to supply the mines is now growing up, principally in pine, but the second growth is so slow that it will require many years for it to attain a size sufficient for mining timber. The new growth is very thick, and on some of the lower slopes of the mountains, where it is over twenty years old, there are few trees ten inches in diameter, and the average diameter will not exceed six inches. In the Tahoe basin, which has been cut over principally within the last ten years, the young trees are about five feet high and will average about four inches in diameter. In the Sierra Nevada fir predominates on the northern slopes, where the snow remains the longest and the sun shines the least. On the other slopes pine largely predominates.

Aluminum: Quantity and Price for Last Ten Years.

The *Aluminum World* gives the following table showing the quantity and price of manufactured aluminum for each year from 1884 till 1893:

Date.	Pounds.	Price per pound.
1884	150	$9 00
1885	283	9 00
1886	3,000	9 00
1887	18,000	3 27
1888	19,000	3 42
1889	47,468	2 04
1890	61,281	1 55
1891	150,000	66
1892	259,885	66
1893	330,620	75

WRITING to the Union, Or., *Scout*, a Cornucopia man says: "We know the mines of Baker county are all running and the mines of Union county (confessedly the best in the State) are all idle. Why? Because the Baker papers keep their mines before the mining world and their articles are copied all over the West, especially in the MINING AND SCIENTIFIC PRESS of San Francisco."

Canadian Lumber.

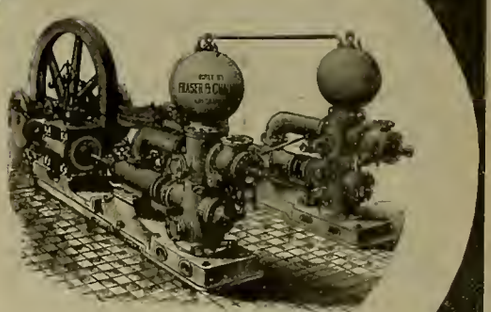
Canadian lumber resources will undergo a very exhausting drain during this year and next. The present tariff system of the United States admits lumber free, but, as this tariff is exceedingly unpopular, and as the voters of the Republic in November last pronounced against it in unmistakable terms, it is taken for granted that it will be in operation only until 1897 at the furthest. Acting on this belief, all Americans owning wooded lands in Canada will do all that lies in their power to strip those lands before a new tariff shall be enacted that shall place a duty on imported lumber. They will strain every nerve to rush their Canadian trees into lumber, and to rush the lumber over the border. In this they will be imitated by the Canadians who own wooded lands. All of them will hasten to take advantage of the free markets here. The result will probably be a larger inroad into the forests of Canada during 1895, 1896 and 1897 than was ever before made in three years. The movement will send a good amount of money into Canada, to be sure, but the money will hardly offset the loss of forested area, and the percentage of it that may be classed as profit will actually be very small. Some Canadians, having an eye to the future, do not like the situation at all. They in reality consider the destruction of the Canadian forests an unmixed evil. On this side of the border the movement will work a present financial and industrial hardship, but in the broader sense it will be a benefit to the United States. The great cut for the next three years in Canada will be made on all the most accessible forest tracts, and, after those tracts are cleared, there will be an increase in the cost of Canadian lumber, by reason of greater expense necessary to move it from the remoter tracts to the shipping points. American owners of Canadian limits are slashing right and left, and when, at the end of the free-lumber period, they lay down their axes, they will have converted many square miles of forest into stumpy, chip-covered wastes, on which great fires will feed. Canada has got a free-lumber market now in the United States, but it will in the end prove to be a dear investment for Canada.—The Lumber World.

THE largest derrick in the world is said to be that used in the granite quarry of C. E. Taynton & Co., at Barre, Vt. Its mast is 99 feet high and is held by 10 guys, each running out about 200 feet to heavy anchorages. The boom can swing around a circle 142 feet in diameter, and, like the mast, is built of Phœnix columns, such as are used in structural iron work in buildings. The loads are hoisted by means of a steel wire rope 1¼ inches in diameter, and the boom itself is handled with a similar rope of three-quarters of an inch diameter. Over a mile of steel rope was used in rigging the derrick, and its weight, exclusive of the rope, is about fifty thousand pounds. It is operated by means of a hoisting engine, and so well are all the parts designed that a pull of 300 pounds at the end of the boom will revolve the whole appliance when the boom is horizontal and loaded with 37½ tons. The derrick has been tested with a load of 57½ tons, although designed to carry only 40 tons; and if the ropes were heavy enough the remainder of the apparatus has sufficient strength to carry loads of 80 tons. It replaces a derrick which had a mast and booms of very large sticks of pine, but the largest which could be procured were unable to raise with safety the heavy loads that had to be handled occasionally in the quarry.

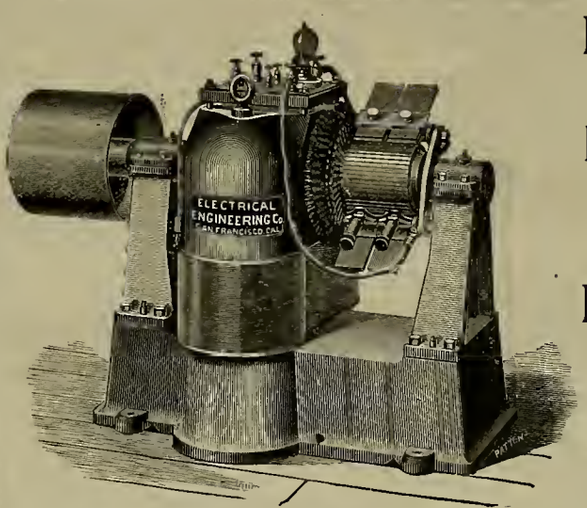
TO REPAIR a feed or other water pipe, mix a moderately stiff putty from red and white lead with boiled linseed oil, and work into it some hemp chopped into short lengths; apply it over the crack in a moderately thick mass; then wrap some strips of canvas parceling round the rope tightly, and finish by sewing marline hard over the parceling.

Power, Mining, Milling, Smelting, Concentration and Leaching Machinery; Return Tubular and Water Tube Boilers, Corliss Engines, Jones' Mechanical Stokers, Hoisting Engines, Riedler Air and Gas Compressors, Riedler Pumping and Blowing Engines, Cornish Pumps, Roots Blowers, Copper Converters, Pyritic Smelters, Horseshoe Roasting Furnaces, Comet Crushers, Crushing Rolls, Stamp Mills, Shoes, Dies, Perforated Metals, Sectional Machinery, Huntington Mills, Frue Vanners, Bridgman Samplers, Concrete Mixers, Heavy Machinery and Mine Supplies. = = Write for Catalogues

FRASER & CHALMERS
CHICAGO, ILL., U. S. A. and
43 Threadneedle St., E. C., London, Eng.



Works at Chicago, Ill., U. S. A., and Erith, Kent, Eng.
Branch Offices: 2 Wall St., New York; City of Mexico, Mex.; 527 17th St., Denver, Colo.; Helena, Montana; Salt Lake City, Utah.



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MANUFACTURERS OF
Dynamos and Electric Motors
FOR THE TRANSMISSION AND DISTRIBUTION OF POWER.
Electric Power Apparatus
FOR
Quartz Mills, Hoisting, Pumping, Drilling,
And all Mining Work where Long Distance Transmission is required
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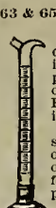

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
M.C.C.² BATTERSEA
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.
Agents of the **Denver Fire Clay Co.** and for the **Morgan Crucible Co.**, Battersea, England. Also for **E. G. Denniston's Silver Plated Amalgam Plates.** The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.
JOHN TAYLOR & CO.

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ESTABLISHED 1863
Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us enables us to give advice which will save inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address **DEWEY & CO., Patent Agents, 220 Market St., S.F.**

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Business College,
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FOR SEVENTY-FIVE DOLLARS
This College Instructs in Shorthand, Type-Writing Bookkeeping, Telegraphy, Penmanship, Drawing, all the English branches, and everything pertaining to business, for full six months. We have sixteen teachers and give individual instruction to all our pupils.
A Department of Electrical Engineering
Has been established under a thoroughly qualified instructor. The course is thoroughly practical. Send for Circular. C. S. HALEY, Sec.

Market Reports.

The Markets.

SAN FRANCISCO, March 14, 1895.

A further drop in lead and copper, and an advance in silver, characterized the week. The assertion again finds credence that silver is sure to ascend. There is increased interest in the prospect for recognition of its demands.

The demonetization of the silver dollar twenty-two years ago has always heen as much of a historical puzzle as "The Man in the Iron Mask."

No bill was ever passed to demonetize silver. Silver was demonetized by a trick, and not more than two or three men in the city of Washington knew when it was done or within a year thereafter, even, that it had heen done. This demonetization was the result of a combination among half a dozen of the leading gamblers of the gold board, which had its ramifications ahroad. The coinage committee of the House reported a "bill to codify the mint laws." The necessity for that codification was well known, and the chairman explained that no change had heen made in any way of laws, hut that the different acts hearing upon the mint had heen brought together under one section. The hill was not even read, except hy title. It was passed without one dissenting vote. In the section enumerating the different silver coins of the United States the word "dollar" was omitted, beginning "the half dollar," etc. No one noticed the omission. Even a careful reading of the hill hy every memher of Congress would not have revealed the trick to any one of them. No memher was thinking of the demonetization of silver. No memher had ever suggested such a thing. The silver dollar was at three cents premium over the gold dollar, and when the gold dollar was quoted at 116 the silver dollar was quoted at 119. The word had been striken out hy some member of the committee without the knowledge of his unsuspecting colleagues; hut who did it has never heen discovered. In after years each member of the committee on coinage expressly disclaimed any knowledge of the trick or that he knew or had heard that the word "dollar" had heen omitted. The bill went to the Senate, was referred to its committee on coinage, examined perfunctorily, reported by Mr. Sherman (the chairman) to the Senate, and passed hy the Senate on Mr. Sherman's assurauce that it made no change in the law, only bringing all the different laws together. After the hill was passed the secret that silver had heen demonetized was carefully kept. No memher of the Government knew it. Six months after, and again a year after, President Grant, not knowing that silver had been demonetized, advocated the coinage of more silver dollars. At that time there were none in the country. The Secretary of the Treasury also advocated the same thing. To their intense astonishment they were shown the report of the director of the German mint, in which he stated that America had demonetized its silver coinage. The statement had been laughed at as the blunder of a foreigner, hut upon an examination of the mint laws as codified under the act of the year hefore, it was discovered that silver had heen demonetized for a year. Every effort from that moment to this to take the hack track has heen defeated.

New York Metal Market.

NEW YORK, March 14.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.

COPPER—Brokers', 9.40c; exchange, 9.60c.

LEAD—Brokers', $2.95; exchange, $3.

TIN—Straits, 13¾c.

SPELTER—Domestic, $3.20.

New York Prices.

NEW YORK, Mar. 14.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	27½	60½	9 40	3
Saturday	27⅝	60½	9 40	3 02½
Monday	27¾	60¾	.....	.....
Tuesday	27¾	60⅝	.....	.....
Wednesday	27⅞	60⅞	9 40	3
Thursday	27⅞	61¼	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, ⅝ per annum.....7@8
Commercial Loans, prime.....6@8
Call Loans, gilt edged.....7@8
Call Loans, mixed securities.....7@8
Mortgages, prime, taxes paid by lender.....7
New York Sigbt Draft.....10c
New York Telegraphic Transfer.....12½c
London Bankers' 60 days.....$4.88¾
London Merchants.....$4.86
London Sight Bankers.....$4.89¾
Refined Silver, per ounce.....61¼c
Mexican Dollars, nominal.....49@49½

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	6 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 7 75
Greta	7 50
Nanaimo	6 25
Gilman	5 75
Seattle	6 00
Coos Bay	5 50
Cannel	8 00
Egg, bard	12 50
Wallsend	7 00
Scotch Splint	8 00
Brymbo	7 50
West Hartley	8 50

TO ARRIVE—PER TON.

Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	11 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'	75c	@	bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, March 14, 1895.

Comstocks opened quiet this week, advanced on Tuesday, had a sethack and held their own the days following. The "spring deal" has not materialized yet, though, as far as the real basis is concerned, the mines are in better shape uow than for some time hefore. Bodie Con. sold up to $1.45, exhihiting the most streugth of any on the list.

A gentleman from the Comstock, who visited the Eureka mill, tells the *Enterprise* that the Chicago syndicate which bought the tailings and recently completed the plant at the Eureka mill, is making a success out of the prospect. Eighty-eight per cent of the assay value of the tailings is heing saved aud everything is running in a prosperous manner.

At the anuual meeting of the Hale & Norcross, the following was adopted:

WHEREAS, The Supreme Court of this State has decided that the rule as to declaring dividends is, "That the apportionments of the net earnings to the payment of cash dividends is largely one of policy intrusted to the discretion of the directors"; and whereas, this corporation is a judgment creditor for more than $1,000,000 in the case of M. W. Fox vs. this compauy and others, which said judgment has heen appealed from and the said appeal has been argued and submitted to the Supreme Court;

Now, therefore, we, the stockholders of said corporation, do herehy authorize, empower and direct the trustees or directors of this corporation, in case judgment shall he affirmed in whole or in part to declare dividends to the stockholders immediately upon the collection of said moneys of the whole amount of said collection, less the debts and claims against said company, and the further sum of $25,000 to he retained for the use of the company and the dead work of the same.

At the delinquent assessment sale of the Sierra Nevada Mining Company, held last Monday, 784 shares were offered for sale, for non-payment of the assessment.

At the delinquent assessment sale of the Gould & Curry Company, on Tuesday, 1100 shares were offered.

Articles of incorporation of the H. P. Taylor Mining Company have heen filed. Principal place of husiness, Sau Francisco. Capital stock, $500,000, with W. Patterson, H. P. Taylor Jr., J. H. Smith, D. T. Cole and A. C. Hammond as directors.

The following illustrates the changes of the week:

MINES.	7	14
Alpha	$ 09	$ 10
Alta Consolidated	32	32
Andes	.....	29
Belcher	47	.....
Best & Belcher	95	91
Bodie	92	1 40
Bullion	24	.....
Challenge	44	.....
Cbollar	59	53
Confidence	1 60	1 50
Consolidated California and Virginia	2 95	2 80
Consolidated New York	.....	.....
Crown Point	49	41
Exchequer	09	04
Gould & Curry	55	53
Hale & Norcross	1 25	98
Justice	.....	18
Mexican	94	92
Opbir	1 90	1 80
Overman	17	15
Potosi	56	.....
Savage	47	39
Sierra Nevada	71	82
Union	56	58
Utah	.....	07
Yellow Jacket	67	57

San Francisco Stock Board Sales.

SAN FRANCISCO, March 14, 1895.

9:30 A. M. SESSION.

50 Alpha Cou	10	500 Hale & Norcross	96
100	09	200	95
250 Andes	29	500 Mexican	91
50	28	100 Mono	28
550 Bodie	1 35	350 Opbir	1 80
100 Bulwer	21	200 Seg Belcher	18
300 Chollar	50	400 Sierra Nevada	79
200 Crown Point	41	100	80
150 C. C. V	2 80	50 Union	58
10	2 75	200 Utah	07
100 Gould & Curry	53	100 Yellow Jacket	57

SECOND SESSION—2:30 P. M.

200 Alta	32	200 H & N	98
200 Andes	29	200 Justice	18
200 Best & Belcher	91	100 Mexican	92
50 Benton Con	50	100 Opbir	1 80
650 Bodie	1 40	300	1 75
600 Bulwer	22	500 Overman	15
300 Chollar	53	500 Savage	39
100 Confidence	1 50	300 Sierra Nevada	82
450 Con Cal & Va	2 80	100 Union Con	58
500 Crown Point	41	100	57
1000 Exchequer	04	100 Yellow Jacket	57

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied,*	*Delinq't and Sale.*	*Secretary.*
Belcher S M Co, Nev	50	25c	Mar 5,	Apr 9, Apr 30	C L Perkins, 309 Montgomery
Booth G M Co, Cal	5	2c	Feh 18,	Mar 25, Apr 17	Geo R Spinney, 310 Pine
Bullion M Co, Nev	44	10c	Jan 21,	Feh 26, Mar 21	R R Grayson, 331 Pine
Bullion Con G M Co, Cal	1	10c	Feh 19,	Mar 25, Apr 25	C A Grow, Mills Building
Challenge Con, Nev	18	5c	Feh 19,	Mar 26, Apr 16	C L McCoy, Mills Building
Con New York, Nev	13	5c	Feh 19,	Mar 26, Apr 17	Chas E Elliott, 309 Montgomery
Crown Point G & S M Co, Nev	65	25c	Mar 12,	Apr 16, May 7	Jas. Newlands, Mills Building
Eureka Con, Nev	13	25c	Feh 19,	Mar 25, Apr 11	H P Bush, 134 Market
Granite G M Co, Cal	2	1½c	Jan 2,	Mar 9, Apr 6	Wm Schaw
Gray Eagle M Co, Cal	39	5c	Mar 2,	Apr 8, Apr 26	A P Swain 309 Montgomery
Inyo Marble Co, Cal	26	10c	Jan 21,	Mar 6, April 5	W W Sargeant, Mills Building
Iowa M Co, Nev	30	5c	Mar 6,	Apr 9, Apr 27	R L Thomas, 419 California
Julia Con M Co, Nev	26	5c	Feh 13,	Mar 20, Apr 10	J Stadtfeld, Jr., 309 Montgomery
Justice M Co, Nev	58	10c	Feh 9,	Mar 14, Apr 3	R E Kelly, 309 Montgomery
La Candelaria M Co, Mex	8	$2	Mar 7,	Apr 9, Apr 27	G A Hill, 22 Market
La Grange H M Co, Cal	10	35c	Feh 23,	Apr 1, Apr 22	A Halsey, 328 Montgomery
North San Juan G M Co	1	12c	Jan 28,	Mar 8, Mar 27	H W Morris, 143 First
Osborn Hill G M Co, Cal	4	25c	Feh 27,	Apr 4, Apr 24	R R Grayson, 331 Pine
Reed M & M Co, Nev	1	2c	Dec 31,	Feh 11, April 3	John H Isham, room 33, Mills Bldg.
South Eureka M Co, Cal	17	1c	Feh 20,	Apr 1, Apr 22	A Halsey, 328 Montgomery
Standard Gravel Co, Cal	1	12c	Jan 25,	Mar 4, Mar 22	W H Schmidt, 207 East
Starligbt Mining Co, Cal	5	10c	Feh 11,	Mar 18, Apr 8	H R Williar, 214 Pine

MEETINGS.

Company and Location.	*Secretary and Office in S. F.*	*Date.*
Cbollar M Co, Nev	C E Elliott, 79 Nevada Block	March 20

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING MARCH 5, 1895.

535,162.—WHOD SHAPER—G. H. Carlson, Hoquiam, Wash.

535,320.—CONVEYOR—W. B. Comstock, Oak Bar, Cal.

535,322.—SEWER FLUSHER—P. B. Donahoo, Oakland, Cal.

535,058.—THILL COUPLING—W. L. Frazer, National City, Cal.

535,329.—MOTOR—J. Gambetti, Stockton, Cal.

535,100.—BURGLAR ALARM—J. B. Gill, S. F.

535,108.—MARLINE SPIKE—A. Helgesson, Portland, Or.

535,246.—HAULING SEINES—R. D. Hume, Gold Beach, Or.

535,253.—CAR COUPLING—J. C. Look, San Jose, Cal.

535,254.—CAR COUPLING—J. C. Look, San Jose, Cal.

535,260.—PULVERIZER—W. B. McPherson, Victor, Cal.

535,130.—WINDMILL—P. A. Norberg, Roslyn, Wash.

535,297.—ELECTRIC RAILWAY—A. Rosenholz, S. F.

535,302.—TRACK CLEANER—A. J. Smith, Stockton, Cal.

535,231.—SEAT FASTENER—C. G. Taylor, Farmington, Wash

535,125.—SCHOP—W. Vincent, Los Angelcs, Cal.

535,151.—CAR COUPLING—C. Whitmore, Stockton, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SECTIONAL CONDUCTOR SYSTEM FOR ELECTRIC RAILWAYS.—Alfred Rosenholz, San Francisco, Cal., assignor of one-half to Samuel J. Clarke and Harvey S. Browu of same place. No. 535,297. Dated March 5, 1895. This invention relates to improvements in electric railways in which the conducting wires are adapted to pass underneath the ground, and it is adapted to be used in conjunction witb a tuhe or tunnel either built specially for an electric railway, or the tuhe of a cable railway may he used when it is desired to transform the cable road into an electric road. It consists of a main conductor enclosed in tuhes surrounded hy a non-conducting cement, yokes fixed to the interior of the conduit or tunnel and adapted to support the adjacent euds of the conductor tubes at points where the switches are introduced between them, switches consisting of non-conducting casings fitting over the main conductnr hetween the ends of the pipes, a non-conducting tape nr film enclosing the conductor where it emerges from the tuhes, sleeves surrounding the conductor nnd screwing into the ends of the tubes, insulating collars journaled to turn upon said sleeves and fitting into the sides of the tuhular insulated casing which projects at right angles from the conductor, said casing supporting a trolley wire at its inner closed end, with a connection hetween said trolley wire and a contact plate in the interior of the casing, a soft iron core fixed to the main conductor and exteuding within the casing to a point adjacent to the contact plate thereof, an insulated wire having one end connected with the main conductor coiling around the core, with the opposite end connected with an insulated contact plate at the end of the core, wherehy contact is formed between the two plates when the trolley wire is depressed by a passing trolley, and contact hetween the two plates is broken hy a counterbalance weight at the opposite end nf the casing which raises the opposite end after the trolley has passed, so that the electric current is transferred from the main conductor through the intermediate conducting devices to the car while tbe car is passing a certain point and is then at once cut off.

AUTOMATIC SEWER FLUSHER.—P. B. Donahoo, Oakland, Cal. No. 535,322. Dated March 5, 1895. The object of this invention is to provide a means for periodically and automatically flushing and washing out sewers or other discharge pipes, with a novel means for utilizing the manbole well as a reservoir for the collection of water for flushing purposes and discharging said water in a body so as to produce a strong flow through the sewer. It consists of the combination with a sewer and a manhole and well of an opening connecting the well with the sewer, a hase removably fitted into a flanged frame whicb is set in cement surrounding the openiug, a valve seat formed near one end and a valve adapted to close the opening, a bucket hinged near the opposite end below the hase adapted to tilt about its hinge, a tuhe extending through the base above tue bucket to deliver water therein, a rope or chain connected with the buckot and with the valve and a pulley or segment over which the rope or chain passes wherehy the downward movement of the bucket raises the vnlve. Water is delivered into the manhole through a supply pipe, the flow heing regulated so that the water will fill the well to the point of discharge at auy desired time, as once or twice a day or once a week, or other suitable or desired time. The water flowing into the tube passes down into the tilting bucket heneath; and when the bucket has been filled, the weight is sufficient to cause it to tilt about its hinge, pulling up the counterbalance weight upon the other end of the rope or chain, and this allows the water to discharge suddenly in a flood until the bucket is emptied. After this has taken place, the weight of the counterbalance will raise the bucket to its origiual position, and the chamber or well will again fill and discharge as hefore described.

PENDULUM MOTOR.—Johu Gambetta, Stockton, Cal. No. 535,329. Dated March 5, 1895. This invention relates to a dovice which is applicable for the propulsiou of pumping or other machinery or for the driving of a vessel through the water. It consists of a swinging pendulum suspended within the vessel and mechanism through which the oscillations of the pendulum are communicated to drive the propeller or otber machinery. Wben mounted upon a vessel, the pitching and rolling of the vessel serves to move the pendulum, and power is applied from the pendulum fulcrum shaft through pinions, racks and gears, with suitable intermediate pawl and ratchet mechanism, so that the alternate oscillations of the pendulum are transferred to produce continuous rotary motion of the propeller shaft or other machinery in one direction.

PRUNE PRICKER.—A. L. Bancroft, San Francisco, Cal. No. 534,776. Dated Feb. 26, 1895. The object of this device is to provide an automatically operating mechanism through which the prunes pass hy gravitation and alternately fall a short distance, and are then arrested upon a surface provided with sharp perforating points so that the impact will perforate the skins. The invention consists of an inclined chute either stationary or rotary, so arranged that tbe fruit passes from it by gravitation, the angle at which the chute or cylinder is placed regulating the speed with whicb the fruit passes and the force with which it strikes the projecting points which line the bottom and sides of the tube or chute. If a tuhular carrier is employed the fruit may be lifted by suitable arms or cleats, heing carried part way up the sides, and then falliug hy gravitation to the bottom so as to insure its heing properly perforated. In conjunction with this are open channels or bars between which any dirt and leaves are allowed to escape, and the various sizes of fruit may also he graded hy similar arrangement nf bars.

FRUIT GRADER.—Antonio Cerruti, S. F., assignor of two-thirds to Fontana & Co., S. F. No. 534,783. Dated Feh. 26, 1895. This machine separates the fruit according to size, and it consists of traveling separated carriers mounted upon end supports and moving in lines which diverge from one end to the other, one of said carriers moving at a different rate of speed from that of the other carrier. Tbe carrier consists of endless traveling bands of suitable material aud construction—in practice ropes have been found to serve the purpose. The end supports consist of suitahle pulleys and the carriers travel in divergent paths from the head to the foot of tbe machine, so tbat the space between them gradually widens from the upper to the lower end. The carriers are in pairs, and there may he as many pairs as may be desired for any suitable capacity. Meaus are provided, lying in the path of the fruit, for temporarily arresting the movement of the same, wherehy its position hetween the carriers may be changed. These means consist of flexible strips which do not obstruct, hut tend to momentarily arrest the fruit, thereby giving the carriers a better opportunity to turn it into proper position.

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Coast Industrial Notes.

It is estimated that the orange crop of southern California is worth over $4,000,000 this year.

—The Oakland Preserving Company will soon add a meat-packing department, which will give work to an additional 200 hands.

—A handsome catalogue is received from the Bay City Iron Works, Fremont and Mission streets, who are making a specialty of architectural ironwork.

—The National Iron Works have turned out a flyer for the Alaska Improvement Co.—a 40-foot steam launch, with a 30-H. P. engine. She goes north on the bark Harvester.

—The statement of the earnings of the Atlantic & Pacific for the month of January, as given out by the receivers, shows a deficit of $172. This is a gain of $63,654 over that of January, 1894.

—Subscriptions continue to the San Francisco and San Joaquin Valley road. Mayor Sutro generously continues to assure the projectors they have his "moral support," whatever that is.

—Chas. C. Moore, for several years secretary of the San Francisco Tool Co., has succeeded to the business of that defunct concern and will continue the business at 32 First street. Mr. Moore is an experienced man and should do well.

—The International Telephone and Telegraph Company has been granted a franchise to erect and maintain a line from Spokane, Wash., to the British Columbia mining country, a distance of over 200 miles. The company is capitalized at $200,000 and will at once begin construction.

—At the annual meeting of the Mechanics' Institute the new Board of Directors organized by electing the following officers: President, A. S. Hallidie; vice-president, George Cummings; corresponding secretary, Marsden Manson; recording secretary, Charles E. Mooser; Treasurer, First National Bank. The next fair will open in the pavilion on the 13th of August.

Bonner & Hammond of Missoula, Mont., who have contracted with the citizens of Astoria, Or., to build a road from that place to Globe, about sixty miles, will soon establish headquarters at Astoria and begin surveys for the line. It is stated that the bonds of the company have been negotiated. Work must begin by the first of next month, and the road is to be completed by October, 1896.

—An experimental shipment of Pacific coast wheat from Portland, Or., to Liverpool by way of Panama has been undertaken by F. H. Peavy of Minneapolis, Minn. Mail advices from Colon say that a trans-shipment has been effected at the isthmus without injury. The new route saves a long voyage around the Horn. It was a question whether the wheat would not be spoiled by the weather it would encounter crossing the isthmus.

—Representatives of California iron industries will take prominent part in the Manufacturers' Convention next Tuesday. Three papers will be presented: "Loyalty Toward One Another and Home Industries," "Freight Rates," and "Specialties in Manufacturing." The committee to draw up the papers consists of James Spiers of the Fulton Iron Works, G. W. Dickie of the Union, Robert S. Moore of the Risdon, J. W. Kerr of the Phœnix Foundry, and W. P. Sullivan of the Pacific Rolling Mills.

—The following is a statement of the Tacoma Smelting and Refining Company for February, 1895: Number of men employed, 62. Pay roll, $4,683.16; woodchoppers and teams, $336; total, $5,019.16. Product—Bullion, 2000 bars weighing 205,577 pounds; copper matte weighing 115,600 pounds. Contents—1,186.81 ounces gold at $20.67, $24,631.36; 27,089.05 ounces silver at $.60, $16,253.43; 229 532 pounds lead at $3.022 per cwt., $6,943.34; 41,680 pounds copper at $.092 per pound, $3,959.60; total, $51,687.73.

The "free zone" of Mexico consists of a strip of land twenty kilometers wide, extending along the northern boundary line of Mexico, from the Pacific ocean to the Gulf of Mexico. The strip is about 12½ miles in extent and probably includes all the cities and towns in Mexico situated on the border line, the principal ones of which are Nogales, Juarez, Piedras Negras, Matamoras, Nuevo Laredo and Tia Juana, Lower California. Merchandise exported hence has never been absolutely free of duty in what is termed the free zone, but is, and has been, subject to duty at the rate of ten per cent ad valorem—a rate, however, much less than the regular Mexican duties.

The check-raising swindle on the Union Pacific has forced the company to either pay in currency, as in old days, or else adopt a paper that is chemical proof. The company is convinced that chemically prepared paper safeguards against this class of swindles is a myth. They succeeded in finding an acid that would remove the best Stanford ink from the face of checks, at the same time not even destroying a fiber of the Underwood chemical paper upon which the checks of the Union Pacific are printed. The checks which were raised failed to show a single erasure mark, and the amount of the checks in figures in the right-hand corner, as well as the written amount in the body of the check, were wiped out as completely as if a cloth had been used in removing dust from a table top.

Assessment Notices.

FAIRFAX VILLA COMPANY. Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 8th day of February, 1895, an assessment, No. 2, of one hundred dollars ($100) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of March, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY the 16th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. STADTFELD, Jr., Secretary.

Office—Room No. 56, No. 309 Montgomery street, San Francisco, California.

CHALLENGE CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the nineteenth (19th) day of February, 1895, an assessment (No. 18) of Five Cents (5c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 35, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-sixth (26th) day of March, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on TUESDAY, the sixteenth (16th) day of April, 1895, to pay the delinquent assessment, together with cost of advertising and expenses of sale.

By order of the Board of Directors.

C. L. McCOY, Secretary.

Office—Room 35, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

BOOTH GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Auburn, Placer county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the eighteenth day of February, 1895, an assessment (No. 5) of Two (2c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, No. 310 Pine street, Room No. 28, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on WEDNESDAY the seventeenth day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. K. SPINNEY, Secretary.

Office—No. 310 Pine street, Room No. 28, San Francisco, California.

IOWA MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia City, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of March, 1895, an assessment (No. 20) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 2, 419 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of April, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on SATURDAY, the 27th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

K. L. THOMAS, Secretary.

Office—Room 2, 419 California Street, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA. Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment No. 26, levied on the 21st day of January, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amt.
M. J. McDonald, Trustee.	294	5,000	$500 00
M. J. McDonald	453	250	25 00
C. P. Rixford, Trustee.	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee.	360	122	12 20
Alex. McLaughlin	414	200	20 00
W. D. Mansfield, Trustee.	438	131	13 10
Geo. Dillman	420	980	98 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	449	31	3 10
Louis Vesaria, Trustee	308	1,000	100 00
Louis Vesaria, Trustee.	346	307	30 70
Israel Luce, Trustee	397	1,000	100 00
A. F. Thane, Trustee	447	500	50 00
Chas. E. Anderson	456	500	50 00
Chas. E. Anderson, Trustee.	463	12,165	1,216 50
W. W. Sargeant, Trustee.	482	1,250	125 00
W. W. Sargeant, Trustee.	485	1,000	100 00
W. W. Sargeant, Trustee.	488	745	74 50
W. W. Sargeant, Trustee.	505	1,000	100 00
W. W. Sargeant, Trustee.	514	500	50 00
W. W. Sargeant, Trustee.	516	1000	100 00
W. W. Sargeant, Trustee.	518	1,000	100 00
Jos. Rosenthal,	480	5	50
H. H. Noble, Trustee.	523	4,000	400 00
H. H. Noble	524	100	10 00
Mrs. Hattie C. Baggs	305	600	60 00
Mrs. Hattie C. Baggs	306	379	37 90
Mrs. Hattie C. Baggs	317	301	30 10

And in accordance with law, and an order of the Board of Directors, made on the 21st day of January, 1885, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 13, Third Floor, Mills Building, San Francisco, California, on FRIDAY, the 5th day of April, 1895, at the hour of one o'clock P. M. of said day, to pay delinquent assessments thereon together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office—Room 13, Third Floor, Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

DUMBARTON LAND AND IMPROVEMENT COMPANY.—Location of principal place of business, San Francisco, California; location of works, in the counties of Alameda and Santa Clara, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 7) levied on the 23d day of January, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Name	No. Certificate.	No. Shares.	Amt.
Charles L. Benton	507	200	$25 00
Charles L. Benton	509	100	12 50
Mrs. Ellen Dwyer	124	100	12 50
Edward Fox	521	400	50 00
Mrs. Elma Glover	113	60	7 50
Jabez Howes, Trustee	150	1,200	150 00
Jabez Howes, Trustee	187	667	83 38
Jabez Howes, Trustee	494	500	62 50
Jabez Howes, Trustee	495	500	62 50
Jabez Howes, Trustee	512	50	6 25
Jabez Howes, Trustee.	533	125	15 62
Jabez Howes, Trustee	5801	175	21 88
Patrick Holland	137	50	6 25
D. E. Hayes.	156	40	5 00
D. E. Hayes.	191	1,000	125 00
D. B. Hinckley	497	1,000	125 00
A. Kuppenman	248	400	50 00
Mrs. Annie A. Pritchard	120	50	6 25
Mrs. Annie A. Pritchard	122	100	12 50
H. W. Quitzow.	129	100	12 50
H. W. Quitzow.	130	100	12 50
H. W. Quitzow.	131	100	12 50
H. W. Quitzow.	132	25	3 13
H. W. Quitzow.	133	25	3 13
H. W. Quitzow.	134	25	3 12
H. W. Quitzow.	135	50	6 25
Mrs. Catherine Rimington	216	20	2 50
James Spiers	108	1,000	125 00
Mrs. Fannie L. Waller	140	50	6 25
E. L. Wagner.	227	1,000	125 00
L. P. F. Waller	525	220	27 50
L. P. F. Waller	530	100	12 50

And in accordance with law, and an order of the Board of Directors, made on the 22d day of January, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the Company, No. 214 Pine street, on THURSDAY, the 21st day of March, 1895, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JABEZ HOWES, Secretary.

Office—214 Pine street, Room No. 5, San Francisco, California.

NOTICE OF POSTPONEMENT.

In accordance with an order of the Board of Directors of the Dumbarton Land and Improvement Company, adopted at a regular meeting, held on the 26th day of February, 1895, the day of sale for unpaid Assessment No. 7 is postponed to THURSDAY, March 28th, 1895, at 2 P. M.

JABEZ HOWES, Secretary.

Office—214 Pine street, Room 55, San Francisco, California.

DELINQUENT SALE NOTICE.

REED MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Ferguson Mining District, Helene, Lincoln county, Nevada.

NOTICE.—There are delinquent upon the following described stock, on account of assessment No. 1, levied on the 31st day of December, 1894, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amt.
J. H. Isham, Trustee	6	500	$10 00
J. H. Isham, Trustee.	7	2,500	50 00
J. H. Isham, Trustee.	8	50	1 00
J. H. Isham, Trustee	9	50	1 00
J. H. Isham, Trustee	14	33,400	668 00
J. H. Isham, Trustee.	13	73,000	1,460 00
J. H. Isham, Trustee.	18	75,000	1,500 00
Geo. G. Reed.	15	12,857	257 14
Geo. G. Reed.	17	2,143	42 86

And in accordance with law, and an order of the Board of Directors, made on the 31st day of December, 1894, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 33, Tenth Floor, Mills Building, San Francisco, California, on WEDNESDAY, the third (3d) day of April, 1895, at the hour of 11 o'clock A. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of the sale.

J. H. ISHAM, Secretary.

Office—Room 33, Tenth Floor, Mills Building, San Francisco, California.

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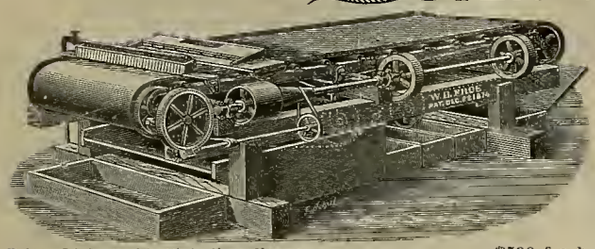

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" 6-foot "	Plain Belt Frue Vanner	600, f. o. b.

GLADSTONE MINING COMPANY, FRENCH GULCH, Shasta Co., Cal.
C. J. Clark, M. E., Gen'l, Supt. Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill.
C. J. CLARK, Gen'l Supt.

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Wind Pressure on Buildings.

A number of instructive experiments on the effects of wind pressure upon buildings and other structures have been made by Prof. Kernot, and communicated by him in a paper read lately before the Australasian Association for the Advancement of Science. Wind for the experiments was obtained from a fan of special design that gave a practically uniform pressure over a considerable area. The effect of vertical walls on the pressure exerted by wind upon the roofs surmounting them was plainly indicated. A roof slanting 60° experienced a reduction of two-fifths in the pressure it sustained when a vertical wall exposed to the same air current was below it. A roof slanting 45° lost four-fifths, and one slanting 30° showed no pressure. The cause of this is that when the side of a house is struck by a current of air traveliug at right angles to its surface the motion is turned into an upward one, and the air slides off the wall in a vertical direction with such force that it wholly or partly takes with it the upper horizontal current that would otherwisc strike the roof. A parapet still further protects the roof from the effects of wind, carrying the oncoming air higher still.

When the old California shares, 108,000 in number, were divided into 540,000 shares, and each share sold at $250, people thought that was a "fancy price" for mining shares. But all that is now exceeded in the present London price of South African mining shares. A leading mining paper has a column of mines advertised. One mine is stocked at 2,500,000 shares, and each share is quoted at £110 offered and £112 asked. When $550 a share is asked (and probably paid) for 2,500,000 shares of stock in a mine, it looks as though the stock gambler and his victim had at last met.

The diminished gold yield of January in the Witwatersrand, South Africa, district, is locally accounted for by the statement that the "imported cyanide contains alkaline sulphides," which absorb the oxygen from the water, and lessens the power of solution. Any kind of sulphides would have a retarding influence, but if the present inflation in mining stock shares is not to be punctured, a more plausible reason for the falling off in the gold yield there must be given the mining public.

The Broken Hill Proprietary Co. have cut down their annual expenses nearly $750,000. The *Australian Mining Standard* is authority for the statement that "the average cost per ton of ore treatcd has now beeu reduced from £6 15s 4d to £2 3s 7d." There is probably some mistake in these figures.

It is to be borne in mind that mere naked possession, work and occupation of a mining claim without complying with location laws will not hold as against subsequent locators of the same ground who do comply with those laws.

The Dayton, Nev., Dredger.

So much interest has been manifested in the illustrated account of the operations of the Carson River Placer Mining and Dredging Co., at Dayton, Nevada, in the issue of February 16th, '95, that we have had our engravers prepare another illustration of the barge, screen and machinery of the company in operation.

The accompanying engraving, like the previous one referred to, is reproduced from a photograph of the plant at Dayton, and gives a very good idea of the machinery that, after years of costly experiment, is now expected to add many millions to the solid wealth of the world.

BARGE AND SCREENING MACHINERY OF THE CARSON RIVER PLACER MINING AND DREDGING COMPANY, AT DAYTON, NEVADA.

A new astronomical observatory is to be erected on Mt. Lowe, southern California, at an altitude of 3500 feet. It will have a refracting telescope with sixteen inches aperature, presented to the director, Dr. Lewis Swift, by the people of Rochester, N. Y., who came to know him through the Warner observatory in that city. Dr. Swift will also have a thirty-seven-inch reflector, but, as that class of telescopes yields only about five-eighths the light obtaiued from a refractor, it will be inferior to the big Lick glass at Mt. Hamilton.

The stone for the mammoth arch in the Parrott building, on Market street, this city, is quarried from the Pioneer quarry, near Corvallis, Or. The arch is over fifty feet across.

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J. F. HALLORAN.....General Manager

San Francisco, March 23, 1895.

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RAILWAY companies' reports are to the effect that few if any paid dividends in '94, and the outlook is none too encouragiug iu '95. 'Tis different in the mining world. The mining dividends in the couutry in '94 outweighed in the aggregate the railway dividends, which is uot so much of an anomaly as it might appear to be at first glance.

THE Goveuor has signed the bill ameuding Section 527 of the Code of Civil Procedure by adding: "No iujunction granted prior to the actual trial of the cause wherein it is granted shall continue in force for a longer period than twelve months from the time such injunction was granted, except by consent of the parties, or unless the cause be set for trial upon its merits."

"FOR Private Circulation Only," the Journal of a London Scientific aud Literary Society, is received, iu which, through thirty nicely printed pages, are argued reasons for its existence. Information is also vouchsafed us that in our particular case the usual requiremeuts as to reference, educational qualifications, etc., will be waived, and merely on the receipt of fifty dollars, we will be enrolled as a "Fellow," aud become the possessor of a handsome silver badge "about the size of an American $20 piece, artistically executed, with name, and laurel wreath of merit." Isn't there some other society in London that essays to protect guileless Americans from such scientific distinction? There certainly ought to be.

THE increased demand for mining machinery includes inquiry for gold stamp mills. The common and usual arrangement is five in a battery, millmen generally considering that an odd number best induces an even distribution of pulp, and five being a convenieut number. Stamps range in weight from 350 to 1000 pounds. Nevada reports the heaviest in use and Colorado the lightest. There is a certain definite proportion between the weight of the shoe, stem, tappet and boss. In au 800-pouud stamp the shoe would weigh about 125 pounds aud the die 100 pouuds. As a general thing, too thick a die occasious a breakage of screens. The drop in a gold mill is froun 12 to 20 inches. The present competitive contest, previously referred to, will go far toward determining the practical nature of the respective claims made.

IT is a fact not susceptible of successful contradiction that there is to-day no branch of busiuess that offers such superior inducements to the investor as the mining industry. While Bradstreet's aud Dun show that ninety-five per cent of mercantile ventures are failures, iu gold mining there is uo competition, a sure market, and the same opportunity for the exercise of skill, iutelligence and economy that exists in any department of business. There is a certain and uncertain amount of distrust arising largely from hazy ideas that all mining partakes, necessarily, of a gamble, and that it is not as "sure" as other business ventures. Memories of sharp practice in some mining companies, or of extravagant management in others, have much to do with those uotions. With such matters legitimate mining has nothiug to do. Such things are inseperable from auy and all lines of busiuess or iuvestment. In uo other business has scieuce, ecouomy and improvement made profit more possible, and iu no other pursuit are there greater probabilities of reward for the judicious employmeut of capital.

IN this issue appear in their entirety three papers read by practical, experienced men at the Manufacturers' Conventiou, now in sessiou in this city. They well illnstrate the tenor and purpose of the meeting, and the consciousness of their truth is the best reason for the occasion that elicits such utterances. The remarks of Messrs. Scott, Spiers, Moore, Brayton, Hallidie and others are to the point, and the requirements of the day are fully recognized. One of the strongest points is made by Mr. Spiers, where he states that labor is the chief factor of cost, and that transportation is but a part of labor cost. And Mr. Moore tersely outlines "the need for co-operation in behalf of the common good," and "that the maxim of 'every one for himself aud the devil take the hindmost' is not good business policy." Our interests are so bound up together that only in taking the largest and broadest views of these matters can the best permanent results be secured. Then, too, as Mr. Moore says, we are on the threshold of a new era, and only by recogniziug the changed condition of affairs can present untoward circumstances be overcome. That these things are plainly stated in the Manufacturers' Convention is good evidence of the practical benefit that can justly be expected to result. The problem is a wide one, into which State pride and sentiment do not enter as largely as State interest and necessity.

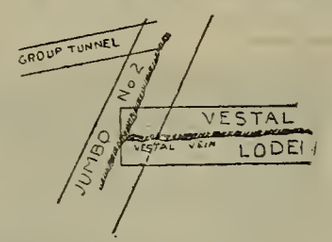
IN no other branch of miuing has so little improvement been made upon original methods as in drift gravel miniug. In a few instauces machinery is beiug used to cheapen and expedite the extraction of gold-bearing gravel, but the general manner of working is substantially the same as years ago. In later days the tunnel is larger and less sinuous and the timbering more substantial. Posts from 10 to 24 inches in diameter are used: caps from twelve iuches upward. The old square tunnel is no longer used, the general dimensions being in the main tunnels seven feet on the bottom, 6½ to 7 feet high and 3½ feet at the top in the clear. The posts thus placed prevent that rapid crowding in at the bottom noticed when set perpendicularly in soft ground. Steel and iron T-rail is used considerably, varying from 16 to 42 pounds to the yard. Though the first cost is considerable, it is found in the end more economical than strap rail laid on wooden stringers. The only noticeable difference in the car is that it is considerably larger, holding more than a cubic yard, and weighing, when full, nearly two tons. The wheels are rigid and the steel axles turn in babbitted, self-oiling boxes. Devices for hauling the cars and securing ventilation have not varied much from original methods. Drift mining is important iu the system itself and the occasioual necessity under existing conditions of resorting to that method of mining in the case of a hydraulic claim. It sometimes takes the place of the latter system where water is scarce, where there is no dump room or where the deposits are low and it would be impracticable to move the whole by piping. It is carried on more like vein mining than hydraulicking, although used only in gravel. Some California drift mines have made very large returns, the Union, in Sierra Co., having a record of $625 per lineal foot in a 2400-foot claim. The conditions of expense vary greatly, ruuning from $1 to $6 a yard. At the Hardscrabble, in Siskiyou Co., the cost per cubic yard has been summarized as follows: Labor, $1.00; timber, .31; lights, .05; horse feed, .02; wear and tear, .12; total, $1.50. In another drift mine the possibility of powder, falls, etc., would increase that average, while the "wear and tear" item is very indefinite and elastic.

An Important Decision.

The United States Court of Appeals at St. Louis, Mo., has made a decision in the case of the Enterprise Mining Co. vs. The Rico-Aspen Con. M. Co., of Colorado, that reverses a former decision on tunnels and tunnel rights. In the decisiou, which since its promulgation was held to be sound law, tuunel owners had only 250 feet either side of the liue of the tunuel. Last week's decision reverses this, giviug tuuuel locators 1500 feet in any direction from the liue of the tunnel. The Court says: "From the time of location and commeucement of his tunnel, under Section 4 of Act 10, 1872 (Section 2323, Revised Statutes), the owner has the inchoate right to possessiou of every blind vein or lode within 3000 feet from the face of such tunnel on the line thereof that was uot known to exist when the tunnel was located and commenced, contiugent only on the diligent prosecution of the work on the tunnel and subsequent discovery of the vein or lode therein."

This is a final decision: no appeal lies to the United States Supreme Court, aud is one of the most important mining law decisions in years, as it definitely decides the rights of mining tunnel locators.

In '79 the Group Tunnel site was located, and for several years excavation was prosecuted. Subsequently the Vestal Lode mining claim was located, based upon the discovery of a veiu at the surface running parallel with the Group tunnel, and about 200 feet from the tunnel line. It will be noticed in



the diagram that the Vestal did not cross the tunnel line, and also, that any veins discovered in the Group tunnel would necessarily cross the Vestal Lode claim. A United States patent was issued to the latter. The Enterprise Mining Co. acquired title to the Group tunnel iu '90; in '92 an ore vein was cut in the tunnel; by driftiug it was found to cross the patented Vestal location, which had passed into the possession of the Rico-Aspen Co.

The Enterprise Company were extracting ore from the Jumbo No. 2 vein, within the lines of the Vestal claim, while the Rico-Aspen Co. were running a drift from a shaft on its Vestal claim so as to reach Jumbo No. 2. Conflict in the mine resulted in litigation; suit was instituted by the Rico-Aspen Co., and an injunction obtained preventing the Enterprise Co. from continuing the removal of ore.

The Circuit Court gave a decree to the effect that the Rico-Aspen Co. was entitled to all that portion of the Jumbo No. 2 vein lying within the Vestal location.

The Enterprise people appealed with the result as above, the Court of Appeals holding that the owner of a tunnel claim is under no obligation to adverse an application for patent for a lode mining claim based upon a surface location, unless the vein has been discovered in the tunnel crossing the surface location, and that the tunnel owner, upon discovering a blind vein crossiug the tunnel, is entitled to the possession of the vein for 1500 feet in one direction or the other from the tunnel, or may, if he chooses, locate the claim partially upon one side and partially upon the other side of the tunnel.

While the decision deals with a Colorado statute of 1861, it in general fixes the principle "that the measurement of the leugth that may be claimed by the tunnel begins at the point of discovery, and measures full 1500 feet in any manner that the discoverers may choose, and this without any reference whatever to surface measuremeuts," which seems to be equity as well as law.

THE coming season promises to be one of great activity in California gold mining—placer, drift and quartz. Gold is the one thing in California to-day that is worth as much as it was a year or five or tweuty years ago, and California is the one State in the Uniou in which gold is the plentiest and the easiest to fiud.

Concentrates.

SILVER is again on the rise.

THE Telegraph mine, Bingham, Utah, is under bond for sale.

TEN STAMPS are to be added to the Santa Rosa mill in Pinecate district.

DEER LODGE, Montana, reports several gold strikes southeast of that town.

A SULPHURIC ACID PLANT is to be built at Deadwood, S. D., to work pyritic ore.

OVER $80,000 in refined gold and silver bullion is missing from the Carson, Nev., mint.

THE OWNERS of the Montana gold mine, in the Black Hills, claim to have $3,000,000 in sight.

THE Senator mine, Mojave Co., Arizona, has been sold to M. W. Flournoy, of Albuquerque, N. M.

THE Mercur Company declared a dividend of $25,000 last week, the first one since last December.

THE absence of Thos. Couch in Arizona has delayed consideration of the bids for the thirty-stamp mill at Mariposa.

CANDLES went up to $9 a box at French Gulch during the recent snow blockade on the Trinity Mountain and Yreka road.

MOHAVE, says the *Miner*, is the only county in Arizona where silver mines are paying working expenses right along.

WESTERN AUSTRALIA recently announced a whistling snake, whereupon British New Guinea comes to the front with a whistling spider.

THE Cispus mining district in the eastern portion of Lewis county, Wash., is attracting attention. Recent assays show from $300 to $500 a ton.

THE new gold find on the desert near Indio, Cal., is in a granite formation, nine miles north of Tingman & Holland's mill in Pinon Mountain.

A GIANT-POWDER EXPLOSION in the Verde mine, Minas Piretas, Sonora, Mexico, last Monday, instantly killed four miners and fatally wounded another.

COLONEL R. F. MORTON, a prominent mining man of Sonora, Mex., was instantly killed by a Chinaman last Monday while he was eating breakfast at the Cananea mines.

SO FAR, $227 have been contributed to the treasury of the Placer County Miners' Association by the miners at the Hidden Treasure mine, Sunny South, Placer county.

DENVER proposes to have a mining and industrial exposition in '96. At a preliminary meeting D. H. Moffat handed in a $50,000 check. A few men like him can make it a success.

A SUIT involving $3,000,000 comes up for trial at Denver next week. It is the famous Bassick mine in Colorado. The property is equipped with machinery of an estimated value of $475,000.

THE Hughes Creek Mining Company, of Lemhi, Idaho, has been organized by Minneapolis men, under the laws of Minnesota, with a capital of $150,000, divided into 3000 shares of $50 per share.

CHARLES MORTON, employed as a shaft repairer at the Hector mine, Sutter Creek, was killed instantly in the shaft of that mine last Saturday afternoon. He was working alone at the 300 level.

LAST WEEK Supt. Casserly at the Alaska mine, Pike City, Sierra Co., captured a specimen thief who was running away with a sack containing ore worth $600. He was allowed to go, minus his booty.

THE Utica mine continues yielding its little $250,000 a month. If they had that mine in the Witwatersrand, S. A., it would be capitalized in London with 20,000,000 shares being placed at £100 each, par value.

THERE is a probability that work will be commenced on the Montana State School of Mines this summer, and that active steps will be taken toward putting Butte into actual possession of the institution which she now has on paper.

THIS is going to be an early season for Montana prospectors and quartz mining operations, but it is feared the placer miner will go unusually short of water about July 1, unless he is situated to control snow water at an early period.

TWO MEN AND A WOMAN have been arrested at Deadwood, S. D., charged with stealing gold amalgam from the Homestake mills. The men were employed in the mine and are reported to have secured $50,000 worth in a period of three years.

THE Reno, Nev., *Journal* says that lumber for sluice-boxes is being hauled out to the placer mines discovered on the northwest side of Peavine mountain. The diggings are not very extensive and are all located. The gold is coarse and of fine quality.

MINES near Banner, San Diego Co., are flourishing. The Ella mine is working day and night shifts. Tracking for 1000 feet of tunnel has arrived. The Blue Hill tunnel is in 700 feet. The old Redwood mine will soon be provided with new pumping machinery.

"MOUNTAINS of gold" and "hundred-ounce nuggets" are now announced from Western Australia. The steamship company which has an advertisement in every interior paper in the State, offering cheap fares to Coolgardie, probably has nothing to do with those reports.

THE Arizona *Republican* says: "Either the Holy Terror mine in South Dakota is exceptionally appropriately named, or the operators are holy terrors when it comes to lying. The mine is reported to have produced $20,000 worth of gold in five days." Arizona can do a little itself in the line of mendacity.

THE Chicago syndicate which recently bought the tailings of the Eureka mill on the Carson river, Nevada, and built a plant for working them, is making a success out of the prospect. Eighty-eight per cent of the assay value of the tailings is being saved and everything is running in a prosperous manner.

LOUIS BLANDING says that the statement that the largest gold nugget ever found on the Pacific Slope was worth but $21,000 is erroneous. He says that J. J. Finney found a lump of gold about six miles from Downieville, Sierra county, on the 21st day of August, 1857, that weighed a fraction over 5000 ounces. Gold was at that time worth about $18 an ounce, which would make the value of that single lump something like $90,000. Blanding further says that there is no doubt that this nugget was the largest piece of gold ever found. The next largest was from the Ballarat (Australia) gold field, and was worth $60,000.

THE Banner mine, thirty miles north of Idaho City, Idaho, is said to be the richest silver mine in that State. Its total output is over $1,000,000. Six years ago it produced $90,000 in a month. The force has recently been cut down, as it does not pay to mine refractory ore, even though it runs from 100 to 300 ounces per ton.

A BRITISH COLUMBIA mining journal describes the formation of the Surprise mine in the Slocan district as follows: "Cambiran, principally schistose argileaux lime and plumbiferous shales with obtusial dykes of feldspathic and auorthyte porphyry." It would seem as though "the component parts were highly metalliferous."

ROBERT DUNCAN, JR., superintendent of the Alaska-Treadwell, writes: "I have received your letter, and in reply beg to say that this and every part of Alaska at this date is overrun with men looking for work, which they cannot obtain; therefore, it would not be good policy to come to Alaska at this time looking for work."

A MINERAL known as proustite, a crystallized ruby silver, assaying from 1200 to 6000 ounces to the ton, and carrying more or less gold, has been discovered several times in Colorado of late. It resembles cube iron very much, has a cherry-red hue and does not turn blood red when scratched with a knife. This makes it richer, as its quality is nearly a pure mineral and is not susceptible to a flaky scratch.

A MINER named Geo. Dey was recently killed at the Gold Ridge Con. mine by an explosion of giant caps, and Superintendent Phelan, coming to this city on behalf of the company, offered to the dead miner's mother to bring the remains here, buy a cemetery lot and pay all the funeral expenses, or have the interment take place in the Sierras and give her what the funeral would cost. She chose the latter, and the company promptly paid her $250.

THE total output for January of the Montana Mining Company was 6470 tons of ore, which contained 2620 ounces of gold and 20,550 ounces of silver. The estimated realizable value of the same is $63,300. The expenditures were as follows: Working expenses on revenue account, $35,200; outlay on developments, $13,900; legal expenses, $900; extraneous and traveling expenses, $1700; machinery, etc., $1000, making a total of $52,700, and leaving a net result of $15,000 for the month.

THE best gold story of the week comes from Utah, where, a telegraphic legend asserts, a young school teacher and his pupils, while engaged in geologic research, found gold galore in the San Juan river. The regular "three old California miners" were on hand to take charge, and the result of the first day's work in the bed of the stream yielded $2300. The next best comes from the Pichaco district, a long letter stating that "white gold" has been found there which "sells readily for $24 an ounce."

MARTIN DALGREEN, manager of one of Governor Grant's mines in Old Mexico, writes of a very peculiar method they have down in that country of impressing miners into the service. The men receive the enormous stipend of 67 cents a day, and are required to take 80 per cent of this out in trade at the company's store. It is but natural that there would be a scarcity of miners at the end of every payday at these prices, even among the Greasers. But they have a very merry way of drumming up recruits, that, while successful in that country, would probably raise trouble if tried on in any mining camp in this State. Every Monday morning the mounted police are sent out to scour the country for men to work in the mines, and those who refuse are sent to jail.

THERE are many different kinds of mines, but there is only one known salve mine, and it is located near Rock creek, Wyo. The mine consists of a grayish colored clay, nearly as hard as a rock, and when placed in water it softens into a salve that will heal cuts, burns, inflammation, and cure bad hoofs in horses, and heal all kinds of wounds, except love's. Determined not to be outdone by Wyoming's new salve mine, Colorado comes to the front with a honey mine. The *Golden Globe* says: On the north side of North Table mountain the bees have for years used the caves and crevices in the rocks as their home. Hundreds of pounds of honey have been taken out of these places the past few years. Many tons of this wild honey have been mined from our mountains, and to get at it the rocks in places had to be blasted away.

THE California Miners' Association, through A. H. Ricketts, chairman of Committee on Mineral Lands, has filed general protests against the patenting of about 500,000 acres of land to railroad companies in this State. The protests go to the Marysville, Los Angeles and Redding districts and oppose the patenting of mineral land. The publication of this effort on the part of the railway companies to absorb mineral land in this State was first made in these columns last October. The attention of the California Miners' Association convention was directed to it at the meeting the following month and vigorous measures adopted to forestall such wholesale grab. Since then the matter has become one of widespread notoriety, and the committee in charge of the matter has spared no effort to thwart the moves of the railway company to acquire title to several hundred thousand acres in this State manifestly mineral in character.

Two decisions have been made by Secretary of the Interior Smith, wherein a former decision in the Pike's Peak case has been overruled. The decision affects mining cases where disputes arise between placer and lode claims. Secretary Smith decides when it has been ascertained by the Department or determined by a court of competent jurisdiction that a lode or claim exists within the boundaries of the land covered by a placer patent, that such lode claim was known to exist at the date of the application for such patent, and was not applied for by the placer claimant, the land in the lode is reserved from the operation of the conveyance, and patent may issue for such lode, if the law has been in other respects fully complied with. The first decision is in the case of N. J. McConnell, known as the South Star Lode case, and the other is the Plain View Mining and Milling Company and Charles H. Peters vs. James Freeman, known as the Freeman Placer case.

How to Stimulate the Iron Industries of San Francisco.

ROBT. S. MOORE, Risdon Iron and Locomotive Works.

The theme assigned me is the "Iron Industries of this City and State," and I am invited to do in ten minutes what all the brains engaged in those industries have not been able to accomplish in as many years. I am requested to suggest a plan, to outline a policy, by which the said industries may be rescued from lethargy and brought to a state of permanent prosperity.

I doubt if the best way to approach the subject is to regard the iron industries by themselves. They, like every other important branch of manufacture, are necessarily dependent upon the general state of trade, and so intimately connected with environing industrial conditions that, only by the improvement of those conditions, can the iron industries be improved.

When mining is depressed, business dull, real estate dead, population stationary or declining, and moneyed men afraid to invest in improvements, the iron men need not look for activity in their line. This is so apparent as to make the statement a truism; yet the truism needs to be forced home on business men who are prone to take narrow views when their individual financial interest is involved and to lose sight of the dependence of their special line of work upon the general welfare.

To my mind, the impulse which gave birth to the idea of convoking this convention augurs much good, not alone for the iron industries, but for *all the industries* represented on this floor.

This impulse arose from the perception of the need for co-operation in behalf of the common good; and when that spirit is stronger in this community than it is now; when California's men of business come to realize, with a vividness that shall control action, that they are all in one boat, we shall then have the "New California," about which so much is being said and written, and of the approach of which this convention is one of the cheering signs.

One of the principles on which the new order of things will be based will be a clearer understanding of the soundness of the business doctrine—that Californians should be for California, and that the maxim of "every one for himself and the devil take the hindmost" is not good business policy. It is action on this maxim that has kept California a colony in tributary bondage to the East.

Turning aside from generalities, I would advise a permanent organization of this Manufacturers' Convention, to be controlled in its work by a body of responsible men, who, by painstaking, intelligent investigation, shall first ascertain the causes of the prevailing stagnation in each particular line of industry, and then present the remedies.

I believe in the efficacy of legislation to help us. We need law to compel home patronage by wealthy corporations in our own and adjacent cities. These corporations exist by favor of law and depend on the California public for their support. Nevertheless, we in the iron trade all know their habit of ignoring their neighbors when they have work to give and purchasing abroad because they can, for the moment, save a few dollars thereby. Theiron industries would at once feel the stimulating effect of the change if these corporations were not penny-wise and pound-foolish. The extent to which they are so is known only to those who suffer most directly by their course.

Hardly a week passes that we do not see proposals advertised and contracts for machinery let to Eastern firms because the latter can underbid our local manufacturers. On the Oakland side of the bay a large corporate water works has just been completed, the entire pumping and boiler equipment of which was brought from Milwaukee. At San Jose the contract for a pumping plant of five million gallons capacity was recently given by the city to a New York concern, and local bids were not entertained or even solicited, and already the representatives of leading Eastern iron firms are opening offices in San Francisco eager for work of every nature and kind.

Gentlemen, this is all wrong; but it is the California custom of cutting her own industrial throat. Hundreds of like cases could be cited from the past, and it would be time well spent to enumerate them in order to prove that our main trouble is with ourselves, and therefore removable by ourselves.

The labor unions have set their employers in the iron industries an example which we should have the intelligence to follow. They have done the best work ever accomplished in the direction which plain self-interest, common sense and practical public spirit dictate. A few years ago, these workmen waited upon the San Francisco supervisors and succeeded in having inserted in street railway franchises a clause compelling the companies to patronize home industries. A similar clause was incorporated in the contracts for the dome of the New City Hall. The plan worked admirably. Law stepped in between unreflecting greed and local public interest, and thus thousands of dollars worth of work was kept at home through the efforts of this handful of organized labor.

In order to compete successfully with the East; in order to become a manufacturing State on a large and flourishing scale, California must of course approach more nearly to Eastern conditions. At present we are all keyed up too high. The pioneer tradition of "easy come, easy go," born of lucky chances and full pockets, still survives and hinders. We are all disposed to live beyond our means and to despise those economics which are mandatory upon an industrial community if it would compete successfully with energetic and intelligent minds elsewhere.

Without dwelling upon the disastrous effects of low freights from the East upon all our industries, I will simply state we are on the eve of a change in these unjust, unnatural and killing conditions, with a bright prospect that we shall soon come by our own again. The new Valley road, with Claus Spreckels at the helm, is, if I may adopt figurative language, the herald of the New California, blowing a blast on its horn which has awakened the whole State and will arouse it still further. This road, it is certain, will start other roads, deprive the East of its artificial privileges in our field and give home energy, home enterprise, home brains and home money a fair chance to do California's work and get their just reward.

To sum up then the needs of the iron industries are not peculiar. They call for co-operation; for patriotic law, where that is practicable; for wise economy in methods of production; for adjustment to Eastern conditions; for recognition of the truth that there must be more public spirit amongst manufacturers and a greater readiness to comprehend that their welfare is bound up indissolubly with the welfare of the whole community.

The Greatest Gold Field.

Written by DAN DE QUILLE.

California is taking a new departure in gold mining. For some years after the war upon the hydraulic miners all kinds of mining was suffered to languish. The old and paying quartz mines and drift diggings continued to be worked, but very little prospecting was done. Though the war of the people of the valleys was only against parties engaged in hydraulic mining, the effect was to discourage and disgust the people of the mountains, who were stigmatized as "outlaws" and "bandits." Some left the mountains and went into the towns of the valleys, others remained and for a time strove to keep themselves and their families by working their mines in secret by night, but spies from the valleys were constantly on the watch and so many were arrested, fined and imprisoned that at last hydraulic mining was as good as killed. It was argued by the people of the "cow counties" that the shutting down of the hydraulic mines would make but little difference in the gold yield of California, as the men of the mountains would at once turn their attention to quartz mining, but an awful falling off in the annual product soon appeared.

Some few tried quartz mining for a time, but the majority clung to their hydraulic claims, out of which they strove to make a living by working them as drift diggings. Men with families dependent upon them could not take chances by roving the mountains in search of paying quartz veins; they were obliged to make sure of some gold, however small the amount, therefore they drifted, creviced, panned and rocked about in their old diggings. All kinds of mining were much demoralized and California began to lose prestige as the great gold-producing State of the country. For several years mining was so much discouraged in California and so great was the decline of that industry that the verdict in the East was that the State was "played out" as a gold producer. The men of the valleys "got on top" and people of the older States were soon led to believe that the "Golden State" was no longer of much value, except for its grain fields and orange groves. From the very first the shutting down of the hydraulic mines was sorely felt by many San Francisco business men, but the agriculturists had the "pull" and the great industry of mining languished. The old, developed, paying quartz and drift mines continued to be worked, but few new enterprises were undertaken, and the little prospecting in progress was conducted in a superficial and desultory manner.

In San Francisco there were always men who longed for the old full flow of gold from the mountains and who were earnestly stirring to revive the waning industry of mining. In this they have been so far successful that the working of hydraulic mines is again permitted under certain conditions—the impounding of the tailings flowing from the diggings. Although but a few of many hydraulic mines have started up under the new law, the beginning made has had a good effect. Interest has again been awakened in the mining industry and prospecting has been resumed in good earnest. The men of the mountains feel that the ban of outlawry has been removed from their class and some recognition given them under the law by the restoration of a part of their old rights. Soon again the mountain towns, as of old, will be the most prosperous in California. Soon again property in the mountains will have value and the mining industry will take its old place to the front.

Gold-bearing quartz veins now constitute about the only property outside of the great financial centers in which there is any encouragement to invest money. In all other industries except gold mining, under the present monetary system, prices of products are steadily going lower and lower. It is only the product of the gold mine that shows increase of value in this time of tumbling values. This being the case, and paying gold mines being about the only kind of property in which it is safe to invest, the gold-bearing veins of California are being looked after. The demand for paying mines has given new life to prospecting and many wonderfully rich discoveries are now being made in the old "Golden State."

To-day there is more gold in the great gravel deposits of the mountains of California than has ever been taken out. Wonderful deposits of the yellow metal to be found in a thousand places in the State, and a hundred years hence rich discoveries will continue to be made, as in many sections the face of the country is covered with such a depth of soil that hundreds and thousands of veins of gold-bearing quartz, great and small, are hidden from sight. From time to time, as the years roll on, one after another these veins will be found and their virgin contents brought to light. Where one large, rich vein is found, parallel veins of the same character almost always exist, therefore one discovery in a new section of country nearly always leads to many others.

Some wonderfully rich deposits of gold have been discovered in the quartz veins of California, but probably there is to-day lying hidden somewhere in the mountains of the State a far bigger bonanza of the yellow metal than has ever yet been found or ever dreamed of. And this great store of gold may to-day be somewhere almost peeping out through the soil of the surface. Of all the gold fields of the world, California is that of the greatest possibilities. The hundreds of millions in dust and nuggets that have been gathered on the surface from the placer deposits show this. All the gold found in the placers, gulches, creeks and rivers—with millions on millions more of fine dust washed away into the sea in the course of ages—was but the result of the decomposition and erosion of the croppings or upper parts of the quartz veins above in the great gold belt lying along the western face of the Sierra Nevada range of mountains. Those millions found in the surface deposits of sand and gravel were but the golden seeds cast off by the blossoming and ripening auriferous quartz veins above. All the gold in the veins below the level of the face of the rock constituting the solid surface formation of the country—the "country rock"—remained in place, and where it has not been discovered and mined out, to-day still lies in the veins.

The quartz veins of the Sierra Nevada mountains constitute the source of all the gold found in the California placer deposits. The hundreds of millions found in the placers, creeks and ravines were but the loose gold shed in the course of ages by the weathering and wearing down of the exposed tops of the veins of auriferous quartz. It is therefore evident that, great as was the amount of gold found scattered about the face of the country, the main store of the yellow metal must remain behind in the veins. For many years the attention of the majority of the miners of California was turned to the placer mines—few meddling with the quartz veins—and even to-day there remain unworked and unexplored whole mountains of auriferous gravel and vast fields of such placers as are usually worked by hydraulic process. Even now the full harvest of surface gold is far from being gathered. Hundreds of millions still remain in the gravel of the hills and flats and in the sands of the streams.

Still, for years some have devoted themselves to the development of the quartz mines of the State, and deep, genuine mining in the veins that are the source of the surface gold may now be said to be fairly under way. At many points along the great mother lode immensely rich mines have been opened and are found to pay steadily year after year. Although some of the oldest of these mines have attained great depth, they still yield well and the veins show no sign of giving out.

In the vicinity of these rich mines, on and along the mother lode, is a fine field for prospectors. The paying mines show a "fertile belt," and in a fertile belt are nearly always to be found parallel veins. The best country in which to prospect is one that has yielded an immense amount of surface gold, which shows good strong sources of the yellow metal in quartz veins. Thus it will be seen that California to-day is the best country in the world for a miner who wishes to prospect for gold quartz. Looking at the immense amount of gold that has been gathered on the surface, then counting the quartz veins that are known and worked, it becomes evident that there must still be hundreds of rich veins that remain to be discovered. There are to-day better chances in California than in South Africa, Australia or any other country on the face of the globe. The chances for making a big find are as good as in any other gold field in the world. The gold deposit that lies undiscovered and untouched is as big to-day as in the days of "'49." Then, the miner can at the present time obtain provisions and all other supplies at cheaper rates in California than in any other gold-producing country in the world. In no State in the Union can a man live better for a small amount of money than in California.

For some years past, until recently, there has been very little prospecting done in California. While prospecting was active in Colorado, Utah, Idaho and other regions to the east, it was almost at a stand in California. The men of the mountains were so worked upon that they gave little thought to prospecting, and most of them were so enraged against the people of the "cow counties" that they would hardly have touched a quartz lode had they known it to be filled with gold. They resented having their hydraulic mines shut down by the valley ranchers and being left to "dig quartz or starve."

Recently, however, the miners are again coming to the front. Eggs, butter and potatoes are now more plentiful in the valleys than gold, and the miners are no longer chased about in the mountains as "outlaws" and "bandits." Almost every week we now hear of new and rich discoveries in quartz. These are not up in the wilds of the mountains, but in and about the old camps, as at Grass Valley, where the first quartz mining in the State was done. There is no better place in which to prospect than in the belts of fertile country about the old camps in Nevada county, Mariposa, Sierra, Tuolumne and other counties up and down along the great mother lode. Even close to the towns all has not been found that the earth contains. Surprising finds are frequently made in and about even the oldest camps. These finds are generally by some outsider or "greenhorn." People living in a mining camp think they known all about the place, and seldom bother with prospecting. When a camp is new, prospecting may be pretty lively for a time, but it soon dies out and that is the end of it until a big find is made by some blundering tenderfoot who does not know quartz from granite or gold from iron pyrites.

In California, in the fertile belts, even the smallest of quartz veins are worth looking after. A vein, however small, that shows gold, is worthy of careful exploration, as it is liable to prove to be a feeder of a large hidden lode, or, if not, may lead to a rich pocket at no great depth. If a vein shows gold at all it is pretty sure to contain pay at some point. Once a prospector becomes well acquainted with a section of country he soon finds a place where he can make enough money to "clear his teeth," and having taken root on the range, he will be in hard luck if he does not within a year or two hit upon a good mine—perhaps tumble into something amazingly rich.

In prospecting, the man who selects a good section in a strong gold belt, and then settles down and makes himself thoroughly acquainted with his surroundings, will be much more likely to succeed than one who runs from place to place expecting to catch something on the wing. There are still hundreds of millions to be found in California, and during the coming summer we are likely to hear of many wonderful discoveries being made. Most of these will be near the old camps, for as yet there is not much scouting up into the high Sierras.

Idaho's Mineral Output for '94.

Frank F. Church, assayer in charge of the United States Assay Office at Boise, has completed his report, showing the total product of gold, silver and lead for the State during the year 1894.

The report points out that the leading mining districts in the State now attracting general attention are the De Lamar and Silver City mining districts of Owyhee county and the Cœur d'Alene district of Shoshone county. Within these districts are a number of mines which have few, if any, equals for richness and quantity of ore beds. Especially is this true of the silver-lead mines of the Cœur d'Alene district, which has increased its output over the previous year, notwithstanding the continued dull market for the product.

Of the placer ground of the Murray district, Shoshone county, he says the output has been steady and substantial. The gold-bearing quartz mines are also quite productive and are very promising in character.

The Warrens district, Idaho county, is fast taking the lead in profitable quartz and placer mining, and will add materially to the production of the State for the present year.

The many good ledges in Boise and Lemhi counties have been developed within the year to such an extent that their profitable operation is no longer a question.

The Seven Devils district, in Washington county, is exceedingly rich in copper, but has been developed meagerly on account of the lack of transportation.

The flour gold to be found in great quantities on the famous Snake river has attracted unusual attention, and has contributed largely to the increased production of the State.

The following is a detailed statement of the output:

GOLD.

Counties.	*Fine Ounces.*	*Value.*
Ada	739	$15,276
Alturas	836	17,282
Bingham	1,788	36,961
Boise	15,859	327,935
Cassia	1,108	22,904
Canyon	1,029	21,271
Custer	1,253	25,902
Elmore	5,139	106,232
Lemhi	13,217	273,230
Logan	1,407	29,085
Idaho	12,116	250,460
Owyhee	37,915	783,773
Shoshone	17,531	362,398
Washington	750	15,504
Other counties	1,000	20,672
Totals	111,687	$2,308,775

SILVER.

Counties.	*Fine Ounces*	*Value.*
Ada	204	$264
Alturas	294,207	380,380
Bingham	225	291
Boise	24,876	32,162
Cassia	195	252
Canyon	220	284
Custer	71,120	91,951
Elmore	2,708	3,501
Lemhi	4,552	5,855
Logan	604	781
Idaho	11,832	19,176
Owyhee	1,004,792	1,299,096
Shoshone	2,343,314	3,029,671
Washington	12,000	15,515
Other counties	500	646
Totals	3,774,349	$4,879,855
Lead production		$2,605,450
Gold and silver		7,188,630
Total production		$9,793,080

For 1893 the production of the State, according to the Mint statement, was as follows:

Gold	$1,603,641
Silver	4,467,464
Lead	2,524,753
Total for 1893	$8,685,858
Total for 1894	$9,793,080
Actual increase	$1,108,222

REPORTS from Mexico indicate that silver production there is being pushed with vigor, and under various concessions which the Government has made new refineries and smelting works are going up, while the railroads make specially low rates to the coast, in marked distinction to the prohibitory rates which the California railroad system puts on silver sent here for shipment to the Orient.

Characteristic Features of California Gold-Quartz Veins.

Read before the Geological Society of America by WALDEMAR LINDGREN, December 29, 1894.

The gold-quartz veins of California, in spite of many local variations, form a remarkably well-defined type of mineral deposits, the salient characteristics of which it is intended to portray in this paper. The results, indicated in brief outlines, have been obtained during general and detailed mapping for the United States Geological Survey in the gold-bearing region of California.

The general map of California indicates the extent and distribution of the gold-quartz veins. Beginning in the peninsula range south of the Mexican boundary, the deposits continue in scattered form and with many intermissions up to Fresno county, a few of them also occurring at isolated points along the coast ranges south of San Francisco. In Fresno county they become more abundant, and in Mariposa county the auriferous belt rapidly widens. From here northward to the point where they are covered by the great lava fields of northeastern California the maximum development is obtained. In latitude 40° the gold deposits extend from the great valley on the west to the summits of the Sierra Nevada on the east. In a northwesterly direction the continuation of the gold-bearing area is found in Shasta, Trinity, Siskiyou and Del Norte counties in California, and its northerly end occupies the counties of Jackson, Josephine and Curry in southwestern Oregon. Volcanic flows and more recent superjacent formations cover the gold-bearing area toward the east and north.

A smaller auriferous belt of less importance runs along the eastern slope of the Sierra Nevada, beginning in Alpine county and continuing southward through Mono, Inyo and San Bernardino counties. Most of the deposits along this line differ more or less from the normal type of the western slope.

In the northern part of the Mexican peninsula and in San Diego county granitic rocks prevail, but in them are imbedded numerous more or less contact-metamorphosed areas of slates and schists of uncertain age. The gold-quartz veins usually occur in, or at least close to, these areas. The principal mining districts in San Diego county are Julian and Banner, in the central part, and Pinacate, near the northern boundary.

Granitic rocks, with smaller schist areas, continue through San Bernardino and Los Angeles counties. Placer deposits and smaller veins are found around San Bernardino mountain, as well as at several places in clay-slate near the summit of the range, in the central and northern part of Los Angeles county. Very scattered and isolated deposits occur in Ventura, Santa Barbara, San Luis Obispo, Monterey and Santa Cruz counties. In Monterey paying veins have been found near the coast at Los Burros, sandstone being mentioned as the country rock. A short distance north of Santa Cruz a few gold-quartz veins are said to occur in unaltered sedimentary formations. In Kern county there is a line of paying veins with a northeasterly strike, extending from Kernville to Tehachipi pass. Granitic rocks predominate, but contain a number of smaller schist areas, with which the gold deposits appear to be associated. The locality is of interest on account of the number of hot springs occurring near the veins. Tulare county contains but few quartz veins, but placer diggings are found along several of the rivers.

In Fresno county, again, several streaks and smaller areas of schists and slates occur in the main granitic mass; again, the quartz veins, which here attain greater importance, are closely associated with the former, though not exclusively occurring in them. Continuing northward for about fifteen miles to Mariposa, these belts of schists and slates suddenly widen, and at the same time begin to contain numerous and rich quartz veins. Between this region and the lava fields of the north lie the most productive gold-mining regions of California.

The western slope of the Sierra Nevada is from here northward occupied by a gradually widening belt of rocks, to which the name "metamorphic series" is usually given. It attains its maximum width in Butte and Plumas counties and continues across northwestern California and southwestern Oregon to the Pacific ocean. The eastern part and the summit of the Sierra Nevada are still occupied by the continuation of the southern granitic area, bordering upon the "metamorphic series," with an irregular and jagged contact line, along which evidence of the later origin and intrusive character of the granite may be frequently observed. The "metamorphic series," sometimes also referred to collectively as the "auriferous slates," is a very complex mass of rocks. It consists largely of more or less altered and highly compressed sediments, of an age ranging from early Paleozoic to late Jurassic, and bearing evidence of having been subjected to several mountain-building disturbances. Associated with these sediments are igneous masses—augite-porphyrite, diabase, serpentine, etcetera—also ranging in age from Paleozoic to late Mesozoic, though the greater mass of them appear to date from late Jurassic or early Cretaceous time. To a considerable extent these igneous rocks have been acted on by the dynamo-metamorphic processes, which also affected the sedimentary rocks, and are largely converted into crystalline schists. It may be said in general that the sedimentary rocks prevail in the eastern part of the metamorphic belt, while along the great valley basic, igneous rocks are found in the greatest abundance. The granitic rocks of the high Sierra Nevada are to a large extent *granodiorites*, the name adopted on the survey maps for a quartz-mica-diorite containing more or less orthoclase. In the metamorphic series there are many smaller masses of the same rock—the latest intrusions—which are usually but little affected by dynamo-metamorphic processes.

The intimate connection of the gold deposits with the metamorphic series or the auriferous slates has been recognized for a long time, and Professor Whitney emphasizes it repeatedly in his works. The auriferous region, indeed, corresponds closely with the extent of the metamorphic series. Even in the south, where the granitic rocks predominate, it has been shown that the gold deposits are usually connected with the shattered schist areas. Few gold-quartz veins are found in the granitic area, and then usually near the contact. Within the typical gold-bearing region the veins are distributed with remarkable impartiality, and occur in almost any of the great variety of rocks which make up the metamorphic series. They are found in granite, diorite, granodiorite, gabbro and serpentine; in quartz-porphyrite, augite or hornblende-porphyrite and diabase; in amphibolite and other dynamo-metamorphosed rocks; in sedimentary, more or less altered slates, sandstones and limestones. In Tertiary volcanic rocks gold deposits are only found on the eastern slope of the range. It is apparently impossible to formulate any law as to their lithologic occurrence or to say that they prevail in any one kind of rock in the metamorphic series.

Regarding the quartz veins of California, F. von Richthofen has made a frequently quoted statement, which in a certain sense may be correct, but which, unless qualified, is apt to lead to grave errors. It is as follows:

> The auriferous quartz veins "have in their occurrence clearly discernible connection with the extension of the granite. They are crowded closely at its contact with the metamorphic rocks, and occur here partly in the former, partly in the latter. The greater the distance from the granite, the rarer they become in the metamorphic rocks, and only occur as an exception where the influence of the outcropping granite would not be expected on account of its distance. In the same way they become less frequent in the granitic regions as the distance from the contact increases, and are, as a rule, entirely lacking in the interior of the large granite masses."

This statement cannot be accepted for the main granitic contact, which, on the contrary, except near Sonora, is remarkably barren of important deposits. In the larger part of the gold region a wide belt of Paleozoic slates, comparatively poor in gold deposits, separates this contact from the principal gold-producing districts. In very many places, however, the contact clearly marks the abrupt beginning of auriferous deposits, though perhaps poor and of small extent. The sudden change of recent and Tertiary river-beds from barren to auriferous when cutting across the contact is often very noticeable.

Though not applicable to the main granitic contact, the statement quoted is to a certain degree true of the smaller masses of granodiorite scattered through the metamorphic series, for it is very common to find the gold-quartz veins clustered near their contacts in the manner indicated. It is not so general, however, as to be called a rule or a law, for there are many included granitic masses the contacts of which are in no way remarkable for abundant deposits.

Dr. W. Moericke, who has recently published several very interesting papers on the gold deposits of Chile, has come to the conclusion that they are closely associated with acid. igneous rocks, and drawn a comparison between the occurrences of that country and California. In view of this, it may be well to emphasize the fact that the gold-quartz veins of California do not in their surface relation show any remarkable dependence on acid, igneous rocks. The great mother lode, for instance, is in location and occurrence of its ores in no way related to such rocks, they being, on the contrary, as a rule, distant from it.

Normal gold-quartz veins in diabase and augite-porphyrite sometimes occur far away from other rocks, although the larger areas of the former are, on the whole, rather barren.

Before beginning the discussion of the characteristics of the deposits, their age may be briefly touched upon. It has long been apparent and insisted upon by Whitney, von Richthofen and others that the quartz veins of California are of late Jurassic or early Cretaceous age, and the same authors have suggested that they probably owe their origin to thermal action following the granitic intrusion. For the larger number of the quartz veins this is undoubtedly true. It is certain that the majority were formed subsequent to the latest dynamo-metamorphism of the sedimentary and old eruptive rocks of the Sierra Nevada, subsequent also to the granitic intrusion. It is, however, also certain that some deposits antedate this period, for in the latest sedimentary member of the bedrock series there are conglomerates containing quartz pebbles and free gold, which appears to have been concentrated as placer gold at the time the conglomerates were formed. It does not appear easy to separate the earlier deposits from the later, but it is probable that they were neither very numerous nor very rich.

Again, the eruptive activity of late Tertiary time which was centered along the summit and on the eastern slope of the Sierra Nevada was followed by another period of thermal activity, and another line of gold deposits was formed. This intermittently recurring action confirms von Richthofen's generalization that a region once metalliferous is always metalliferous. Successive eruptions in such vicinity produce successive mineral deposits, while other eruptive centers are wholly barren of them.

It is desirable to eliminate a few deposits of a different type from the prevailing one. Most important among them are the *impregnations*, of which several examples occur in the Sierra Nevada and which may be of two types: First, zones containing grains of iron pyrites disseminated in fresh dynamo-metamorphic amphibolitic schists. Those zones are seldom strongly auriferous, but may enrich quartz veins passing through them, and are apparently similar to the so-called "fahlbands" in crystalline schists. These deposits are distinctly older than the principal quartz veins and contemporaneous with the dynamo-metamorphism which produced the schists from the diabase and other rocks. Second, impregnations of later date forming irregular zones, in which the massive rocks or schists have been decomposed and filled with secondary auriferous sulphides. These deposits are probably contemporaneous with the principal period of vein filling, and only a phase of it, in which the solutions, instead of following distinct fissures, permeated whole masses of rocks. The first of these types of impregnation is not of great economic importance, but the second sometimes affords large masses of low-grade ores.

Regarding the structural relations of the normal gold-quartz veins it should first be stated that they are fissure veins, and emphatically not so-called segregated veins or "lenticular masses" in the auriferous slates.

It is everywhere plain and evident that the fissures have been broken open subsequently to the metamorphism of the rocks. These post-Jurassic and post-granitic quartz veins form the latest chapter in the Mesozoic revolution in the Sierra Nevada.

Neither Whitney nor von Richthofen commit themselves to an expression of the "segregated" nature of the veins. A. Phillips, in his book on mineral deposits, mentions their affinity to fissure veins, although classing them as "segregated veins." All these writers, however, state that the veins nearly always conform in strike and dip to the inclosing slates. This has evidently led the authors of recent text books to class the California veins as "segregated." Thus Professor J. F. Kemp, in his "Ore Deposits of the United States," classes them as such with some doubt, while Professor R. S. Tarr, in his "Economic Geology of the United States," thinks that "in spite of the recent observations (by H. W. Fairbanks), it still seems as though these quartz veins must be of segregation origin."

Quartz veins like those Professor Tarr has in mind, formed by a sort of dynamo-metamorphic process, I am quite sure do not exist in the gold belt. The somewhat auriferous "fahlbands" in certain amphibolites approach nearest his conception. I am by no means prepared to deny, however, that there may be some minor ore bodies deposited in openings in the slate from silicious solutions derived from the immediately surrounding rocks; but if they occur, they are surely exceptions to the general rule. In altered quartzose slates, nodules and lenses of quartz seemingly of such origin frequently occur on a small scale.

This rule of "parallelism with inclosing slates" must unquestionably be rejected in a general description of the veins. It should first be pointed out that a very large number of veins, especially in the northern part of the gold belt, from Placer to Butte county, do not occur in slates or schists, but in massive rocks, such as diabase, granodiorite or gabbro, and among these a predominating direction of dip and strike does not exist. In slates and schists the veins often strike about parallel to the slaty cleavage—that is, northerly or northwesterly—but other directions are nearly as common. Only very exceptionally is there a strict parallelism in both strike and dip. The great mother lode, for instance, is parallel to the strike of inclosing rocks, but differs not inconsiderably from them in dip. Its character of fissure vein is clear and unquestionable, and has been justly insisted upon by H. W. Fairbanks. All directions and all dips are in fact represented among the California quartz veins, only dips below 20° and above 70° are comparatively rare. A general rule for strike and dip cannot be given; different laws guide them in different mining districts. The quartz veins are the expression of the greater and minor strains to which the Sierra Nevada has been subjected, and a study of the former will, to a considerable degree, illustrate the latter, which have certainly varied in intensity and direction from point to

poiut. Thus, to pick out a few illustrating examples, the veins of Ophir, Placer county, consist of two priucipal systems—one set of veius ruuing west-northwest and dipping south, while the other has a west-southwest strike and southerly dip, both cutting the surrounding schists obliquely to their strike and dip. At Grass Valley and Nevada City there is one system with a general northerly direction and dipping either east or west; another system courses east and west and dips north or south at varying angles. The surrounding rocks are here mostly massive. The veins in the vicinity of Sierra Buttes, Sierra county, show the greatest divergeucies in strike and dip. Equally variable are the veins about Sonora, Tuolumne county.

The force producing these fissures appears in most cases to have been a compressive stress acting at an angle more or less oblique to the horizontal. In some cases this force produced one large and prominent fracture, but far more commonly one or several series of fractures, or a sheeting of the country rock along which the auriferous solutions could circulate. Along the larger fissures cousiderable movement has taken place; but when the country rock has been sheeted, the motion along the individual joints has probably uot been very great. In many cases, when the direction of the movement could be proved, it has been found that a relative upward movement of the hanging wall has taken place. The force did not produce a single, sudden and catastrophic movemeut; on the contrary, it contiuued for a long time, resulting in repeated dislocations, as proved by the re-opening and refilling of some veins and by a sheeting of some veins, producing what is usually described as "ribbou rock." Recemented quartz breccias are also of common occurrence.

I should here like to mention one misleading circumstauce relating to parallelism of vein and country rock. When larger fissures are opened in massive rocks it is not at all uncommon to find the immediately adjoiniug wall rock converted entirely locally into schists parallel to the fissure, under the influence of the enormous shearing stress to which it has been subjected. Such veius would have the appearance of cropping iu pre-existiug schist masses and of parallelism in strike and dip with these. The coudusion to be derived from the relatiou of the veins to the larger, regionally metamorphosed schist masses is that the schistose structure antedates the formation of the veiu fissures, and that the forces to which these fissures are due, while bearing a general similarity to those manifested in the cleavage, often differed from them in directiou to a sensible extent.

Different rocks influence the character of the fissures to some exteut. In massive rocks they are apt to be straight, clear cut and well defined; in slates and serpentines there is often a teudency to spliuter into a network of cracks and fissures, extremely small, but often very rich. Iu such cases, the whole mass, country rock and vein, may be extracted and milled. Linked veins are common, and chambered veins sometimes occur.

Very loug and coutinuous veius are not common, aud in this respect the mother lode is rather au exceptiou. Only rarely can a quartz vein be traced more than a few miles, and many important veins crop out only for a short distance.

(To be Continued.)

Personal.

LIEUT. C. C. GILLETTE has returned from an official visit to Shasta Co.

GEO. JOHNSON is visiting Montana iu the interest of his concentrator.

D. B. HUNTLEY is now managing mining properties in the Mercur, Utah, district.

A. B. CHAMPION, a clever newspaper man, has assumed editorial charge of the Grass Valley *Union*.

I. B. HAMMOND is in Butte, Montana, supervising the construction of the Diamond Hill forty-stamp mill.

E. C. CRELLER, formerly superintendent of the Idaho, is inspecting New Mexico mining property for New York men.

WILLIAM P. ST. AUBURN, one of the owners of the Niagara mine, has taken his Bible and a copy of "King Solomon's Mines," by H. Rider Haggard, and has gone to South Africa to look for the lost mines of the aforesaid King Solomon.

Books Received.

"Finance's Primer," by M. P. Boss, San Francisco.

"Recent Inventions for the Reduction of Ores," by J. Silversmith, Chicago.

"Magnesia—Its Base and Compounds," by Henry G. Hanks, San Francisco.

"Sampling and Measurement of Ore Bodies in Mine Examinations," by Edmund B. Kirby.

"Transactions of the American Institute of Miniug Engineers:" The Tin Deposits of Durango, Mexico, by W. R. Ingalls; Close Sizing Before Jigging, by R. H. Richards; Coal Dust as an Explosive Agent, by D. M. D. Stuart; The White Phosphates of Tennessee, by C. W. Hayes; A Water-Cooling Apparatus, by C. Henrich; Aluminum Bronze, by L. Waldo; Nickel Mine at Lancaster Gap, Pa., by J. F. Kemp; Nomenclature of Zinc Ores, by W. R. Ingalls; Inaccuracy of the Commercial Assay for Silver, by C. A. Stetefoldt; Iron Ores of East Texas, by W. Kennedy; Cinnabar in Texas, by W. P. Blake; Dikes and Reefs of Bendigo, by T. A. Rickard; Genesis of Ore Deposits, by Jos. Le Coute; Nickel and Nickel Steel, by F. L. Sperry; Geology of California Quartz Veins; Jurassic Age in the Sierra Nevada, by W. Lindgren.

Labor as a Factor in Manufacturing.

JAMES SPIERS, Fulton Engineering and Ship-Building Works.

The manufacturing industry on this coast stands in the same relation to that of the East as the manufacturers of the United States do to those of Europe, with the important difference that the manufacturers of the United States are protected against those of Europe by a protcctive tariff and by prohibition in building vessels for the coasting trade, while we as against the East are not. In many cases protection is unnecessary, but in many others it is essential; and in regard to the building of vessels, if those of foreign huild were allowed to do coastwise trade, that industry would he entirely destroyed.

In manufacturing on this coast the only protection that we have is the difference between the freight rate on the raw material which we obtain from the East and that on the manufactured articles. The cost of any manufactured article is practically the labor which has produced it. Various metals or other materials may enter into its composition, hut, in either case, the fact remains the same, that the cost of the labor to produce it virtually makes its value. Take a piece of machinery, for instance: The material in it is iron, steel, brass, copper, habbitt or other alloys, and wood. The cost of the entire material in its native condition is insignificant. The ore from which the steel and iron are produced, while lying in Mother Earth unexposed, has but little value. When time and labor are used to discover the ore body and afterwards to sink the shaft from which the ore is taken, yon add to the value of the underlying metal. When it reaches the surface of the mine more bas been added to its value, due to the labor of mining. The labor of taking it from the mine's mouth to the furnace, with all tbe details of smelting and converting it into pig iron, still further adds to its value. When, after this, it is made into castings, into wrought iron, or converted into steel, its value is still further increased by labor. Labor then again takes hold of it and converts it into the different parts of a machine. The same is true in regard to all other metals and their alloys. The same is also true in regard to any wood that is used in the construction of machinery or other manufactures. When growing in the forest its value is insignificant.

From the foregoing statement it will he seen that wben a machine is produced its cost may be said to consist almost entirely of labor, plus the slight value of the material of which it is made when in its native condition.

The cost of transportation of material from one place to another, if analyzed, will also prove to be that of labor, so that when a piece of machinery is built in any of our workshops it represents the value of the labor put upon it, and the difference between that and the price for which it is sold represents the profit to the manufacturer, or, in other words, his labor. In the case of patented articles the difference between the value of the labor and the selling price is the manufacturer's profit, or his labor, and also a royalty due to the patent.

Precious metals, the value of which is due to their scarcity, etc., are not considered here.

On this coast a great deal of the material which we use comes from the East and has already acquired a value due to the labor of its production, with that of transportation added, so that when we take hold of it its value is more to us, by the cost of freight, than to our brother manufacturers in the East.

Fuel also is higher in value, due to tho long distance of transportation. As this is a large lumber-producing State, the cost price of the same should be in our favor. The cost of transportation of the raw material, as a rule, is less than that of manufactured articles and therefore somewhat in our favor. On the coast of California an artisan can do more work than he can in any of the Eastern manufacturing centers, on account of our superior climatic conditions. The cost of labor here is from 20% to 25% greater than that in the Atlantic States. This higher cost of labor is an inheritance from the early gold-mining period, when we had no transcontinental railroad by which the Eastern manufacturers could pour their goods into the State, the only means of transportation then being by the Isthmus of Panama, delivering goods in sixty days from New York, at large freight rates, and by the route of sailing vessels around Cape Horn, forming an excellent protection to our home industries. Under such conditions no large orders for machinery aud but little for specialties were sent East, while our own manufacturers were kept busy, yielding fair profits to them and good wages to our workingmen. It is quite different uow. With cheap and quick transportation the Eastern manufacturers, whose material and labor cost less, can pour their goods into this city, over the entire coast and into the interior of the State. The extra cost of the material from the East is fully offset hy the freight on the manufactured article.

Our climatic conditions and other minor advantages are in our favor, though not enough to offset the less cost of Eastern labor, proof of which is to be seen in the warehouses of our importers and on the sidewalks in front of their premises.

If any one will go into our large establishments using machinery, including engines, boilers, etc., he will find that nearly all are of Eastern manufacture.

The other day we happened into an establishment using five Corliss engines. We found one of California manufacture, built several years ago. All the others were built East. The boilers were all of Eastern manufacture. The machinery of that establishment would have kept a shop of fair size running six months in the building of their machinery. The Electric Light Company of this city has one or two engines that were built here, hut all the engines put in during the last few years are of Eastern manufacture and of such magnitude that they would keep one of our large shops running for one year without other work. There is much more machinery of Eastern manufacture sold here than would keep our shops busy the whole year round, giving steady, instead of occasional, employment, aiding our industrial population and retaining the money on the coast that is now sent East, instead of which our work-shops are reduced to the condition of jobhing shops, picking up the crumbs left after the Eastern manufacturers have had their fill. The question of greatest importance in the discussion of this subject is that of labor. In the manufacture of any article all engaged in it ought to have an equal share. The raw material demands so much. The artisan or other workingman should have his share and the manufacturer his, as well as a reasonable interest on the money invested. With these properly adjusted there should then he no hindrance to our manufacturing prosperity and the welfare of all engaged in it.

Do we wish to manufacture for our requirements or would we rather send away our money to obtain the manufactured article from the East? If we wish to manufacture we will have to do so at a price to meet that of the East, with freight added, and the question is, How are we to bring this about?

As already stated, the material and merchandise purchased for manufacturing costs so much; the balance is labor and the manufacturer's profit. These last two items should be equitably divided, so that the laborer will receive his share and the manufacturer his. If the manufacturer claims too much, then the laborer unjustly suffers. On the other hand, if the laborer claims too much, the manufacturer cannot go on and business will suffer; but if equitably divided then both will succeed. At the present time it is impossible to compete with the East in building a large class of machinery now brought here, and until such a time as labor is brought approximately to an equality with that of the East efforts in that direction will be unsuccessful.

Could we protect ourselves against the East by a tariff, the discussion of this question would be unnecessary. This is a question on which the manufacturers dislike to publicly express themselves, and it is done here with all due respect to the workingman. It would please us just as much, if not more, to have the wages paid to the workingmen in the East raised rather than have the same reduced here, but if we are to succeed an equality, or nearly so, is essential. If such a condition should he brought about so that mechanics would have constant instead of occasional employment, they would, on the average for the whole year, earn more at a lower rate of wages than they have done in the past at a greater. Such a condition would also bring about a cheaper price for the commodities of life, including rent, fuel, etc. The cost of living to the workingman is very important. With tbe exception of rent and fuel living is as cheap here, and in the case of many articles, cheaper than in the East. Rents within the last few years have been considerably reduced, and we do not think it will he a long time before they will be as low here as anywhere in the United States. Fuel, for some time to come, we think will remain higher, hut less is required on account of warmer winters. With the condition of less cost our workshops can take up specialities instead of doing a little of everything in the line of mechanics, which will be a great relief to their management. At the present time as much hrain work is required in conducting one of our shops as is needed in half a dozen of those in the East where they make specialties.

To relieve the severe strain upon the employer, with reasonable compensation for his labor—to give constant employment to the workingman at a rate of wages which would he just—I think tbat if representatives of each would come together and discuss the subject with their mutual interests in view, that the question could be settled profitably and satisfactorily to all interested and enable California, instead of pouring out her vitality in coin sent to others to supply her wants, to huild up her own industries hy her own hands.

Utilization of Water Powers.

Abstract of a paper read beforo the Manufacturers' Convention, last Wednesday, by A. P. BRAYTON, President of the Pelton Water Wheel Company.

There is no subject so vital to tbe manufacturiug interests of the country as cheap power. It is the one thing absolutely essential to success in any enterprise of this character. The great industrial centers of the world are all located either in close proximity to a water power or where cheap coal is available.

Manufacturing in this State, it is well known, has been carried on at a great disadvantage on account of the high cost of coal, a condition which, after the lapse of more than forty years, has not materially improved, and there is still hut little to hope for in this direction. It is evident, therefore, that some other resource must be had for cheap power, to afford encouragement to our manufacturing interests.

The Pacific coast has a magnificent endowment in its bounteous water supply and under conditions most favorable for its development. Innumerable streams are coursing their way down the mountains, carrying sufficient power, if properly utilized, for every industrial enterprise now existing or likely to be developed during the next half century. This immeasureably vast resource has not heretofore been availed of to any considerable extent—except for mining purposes—on account of its remoteness from desirable points for carrying on manufacturing operations.

The wonderful progress recently made in electric power transmission makes it possible now to avail of water power a distance of fifty miles or more from the source of energy, with comparatively small loss and with all the reliability of the most modern steam appliances. The prediction is made by some of our most conservative electricians that the power of Niagara falls will at no distant day be carried to New York City and Chicago, involving in either case a distance of some 500 miles, and successfully compete with the cheap coal obtainable in these localities. Long before power transmission such a distance may be deemed practicable, the waters of Lake Tahoe and various streams from the Sierras may be made available for power purposes in San Francisco and other cities of the coast.

Even cbeap fuel cannot compete with water power, though electrically transmitted a very considerable distance. This is evidenced from the fact that power transmitted from Niagara falls to Buffalo, twenty miles distant, is expected to compete witb steam produced from coal costing not more than $1.25 per ton and this with a plant involving an outlay of upward of $4,000,000.

The relief sought for, not only in this State, hut in many other localities, is to be found in making these vast sources of energy available for manufacturing and mining purposes to a much larger extent than heretofore and the time is now ripe for enterprises in this direction. There are many accessible points that can he supplied with power so produced, involving a comparatively short transmission, which would soon grow into important manufacturing centers.

To indicate the progress already made in this way, as well as the fact that such means of power are in no sense an experiment, it may he stated that there are now not less than sixty electric transmission plants in operation west of the Missouri river, run by water power, some of large capacity, and every one, so far as is known, has been a most pronounced success, both from an engineering and financial standpoint. A brief reference to some of these may be of interest in this connection.

A 500-H. P. plant, costing about $40,000, was installed on a mine in the Cœur d'Alene district, Idaho, two years ago, and the superintendent reports that the entire cost was saved in the first year's run. In a plant of similar capacity at Ouray, Colorado, involving a cost of some $50,000, a saving of $40,000 a year is claimed over the cost of operating a steam plant. On the plant of the Standard Mining Company at Bodie, in this State, involving a transmission of thirteen miles and an expenditure of $38,000, a saving of $2000 per month is reported by the superintendent. A 2000-H. P. plant, to be operated under 800 feet head, involving a transmission of twenty-three miles and costing $300,000, is now under construction near the City of Mexico, the dividends on which, as claimed by the investors, will return the entire outlay in two year's time.

While these references are somewhat exceptional as to returns, it is a fact beyond question that installations of this character have been in the main extraordinarily remunerative, a large number having paid from twenty-five to forty per cent per annum on the investment.

Power stations, well planned with reference to water supply, distribution and the wants of consumers, afford a safe and profitable outlet for much of the idle capital accumulating in the financial centers of the country. With all the inducements offered, there has, however, been a lack of confidence on the part of capitalists in enterprises of this character, and many projects involving the utilization of water power in various localities, some of great promise and importance in an industrial sense, are languishing for want of financial support. It is to be hoped that such investments may in the future find more favor, especially as they are so intimately connected with the general welfare and prosperity of the community.

In the South it used to be said that "Cotton is King." With us Water is King, as it will not only fertilize all the barren plains, but if harnessed to work, will turn every wheel of industry.

Ore Sorting in Colorado.

The following, by W. A. Bray, is from the Victor *News*: Ore sorting, in a large percentage of mining operations, is one of the most important departments of the work As the ore and the rock come out of the ground they are dumped in the sorting-house, for that purpose.

Each person has a heavy iron casting—a worn stamp-shoe—on which he breaks the ore. The sorting hammer is shaped something like the hammer used by stonecutters, and is made especially for the work. The operation of sorting consists of separating from the waste the ore which is rich enough to pay, or the low-grade ore which is too poor to pay for shipment to the smelters or reduction works for treatment.

The good ore is separated from the waste by clipping off the poor portions of rock from the good, or vice versa. It requires a good deal of skill, in most cases, to break the pieces of ore and rock in such a way so that they can be easily separated without wasting much ore. Sorting is a trade; it is more difficult according to the character of the ore. In some cases the ore occurs in such compact streaks that it is easily separated from the waste, one man being able to sort several tons per day. In these instances the ore, after sorting, will be in pieces ranging in weight from two or three ounces to several pounds. At other times the ore may be in thin streaks, in a great deal of waste, and will require great care in sorting. In these, after sorting, it will be in pieces as large as a walnut. In some cases ore sorters can sort as much ore as ten miners can break in the mine and send to the surface; in other cases it may require half a dozen sorters to dispose of what one miner can break.

The question of sorting is one that cuts a very important figure in the profit-and-loss account of many mines. It is quite evident that the expense of preparing the ore for the market will be a great deal more per ton in the mine where six sorters are required for each miner than where it will be if there is only one sorter for ten miners. This is one of the items in mining accounts for which the great majority of our Eastern friends pay very dearly in learning.

It is very seldom that a mine produces ore so free from waste rock, and in such quantities that it can be waste, that it will not require sorting. Mines of this character, broken or mined separately, are generally those carrying large bodies of low-grade ores. Rich ore generally occurs in small quantities, scattered through a great deal of gangue.

Quartz vs. Placer.

From the early days of Sierra county to this late day most of the energy of the prospector and the money of the capitalist was devoted to the exploration and development of placers.

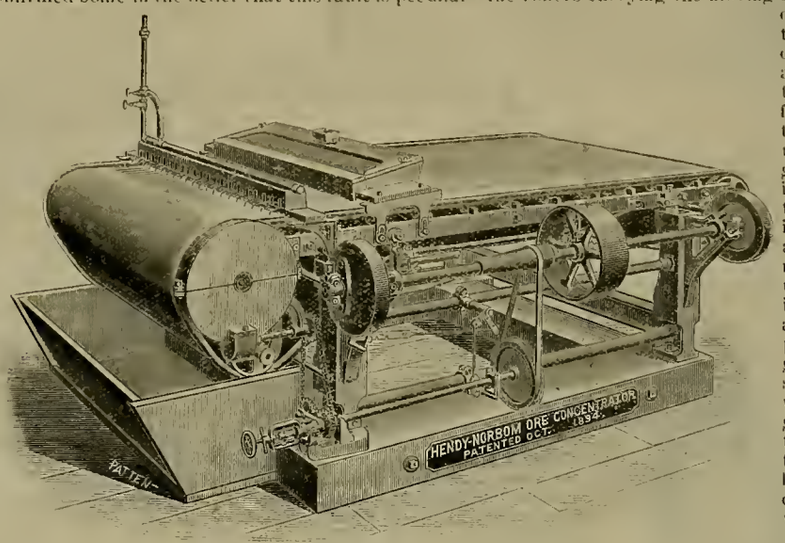
In the very early days this was an easy matter, for the reason that the beds of the rivers, creeks and ravines—their banks and the shallow benches above—were rich in gold, so that from an ounce to a tincupful of gold per day was the ordinary miner's luck; but those days quickly passed and a search for the deep placers was commenced, when, by an aggregation of large numbers of comparatively poor men, many of the deep mines were found, and the Monte Cristo, Fir Cap, Bald Mountain, Old Union, Empire and many other drift mines were then opened, some of which are at work to-day. Later on the assistance of the capitalist was called in, and, by the aid of corporations, the Thistle Shaft, Bonanza, Bald Mountain Extension, Ruby and others were developed and their stream of gold was turned into the channels of trade. Most of this time the impression seemed to prevail that Sierra county was essentially a placer county; that, although it had quartz in abundance, it was supposed to be like the early placers, shallow, or, to use the miner's expression, "It didn't go down," and, as a consequence, comparatively little of the prospecting has been devoted to quartz. On this theory numbers of quartz mines have been worked only as long as the ore could be dropped to the mill, and as soon as it became necessary to sink they were shut down, and a failure in a few instances to find a pay chute of ore on a lower level has almost confirmed some in the belief that this fault is peculiar to our quartz mines; but a moment's consideration of the matter will satisfy any one that it is an assumption based upon the exception and not upon the rule, and the exceptions are taken from the mines where the lowest tunnel still drains them—where no sinking below water level has been made. On the other hand, the Gold Bluff, the Alaska, the Independence, the Marguerite (now called the Tecumseh), the Brush Creek and all of the mines that have been sunk below water level have maintained a uniform richness of ore to the bottom of the shaft, and in every instance where any of these mines have shut down, the cause has not been for lack of pay ore in the bottom, but for inadequate machinery to handle the hoists and pumps.

We therefore contend that everything points to the fact that our mines do go down, and we believe that much of the prosperity of our county depends upon the development of our quartz mines.

"One swallow does not make a summer," nor does the fact that an occasional mine has a barren spot in it make all the mines worthless. The far-famed Kennedy mine, now down over 1500 feet and yielding immensely, was once abandoned because they said it didn't go down, caused by striking a barren spot in it, but after sinking through the barren spot the ore was richer than ever.—Downieville Messenger.

The Hendy-Norbom Concentrator.

The machine herewith illustrated belongs to the class of concentrators in which an endless belt, moving slowly uphill, discharges the concentrated sulphurets over the head or highest end and the tailings run down the belt and discharge at the tail or lower end. It has been customary to give to this class of concentrators or vanners a shaking or percussion motion, caused either by eccentries or cranks operated on a revolving shaft placed either on the side or in front of the shaking frame on which the rollers carrying the moving belt rest. The principle upon which these machines concentrate is by giving a percussion motion to the belt-carrying frame to cause a settling of the sulphurets owing to their greater specific gravity. In places where the free gold occurs in a very fine state and fine crushing is necessary, sliming is unavoidable, and it is very often deemed advisable to sacrifice part of the fine free gold by using coarser screens, the cause of which is that the fine gold will get lost in the coarse sands, but the sulphurets will be in better state for concentration on the vanners.



THE HENDY-NORBOM CONCENTRATOR.

The machine can be converted into a side-shaking vanner by removing the curved springs and inserting the straight legs in their places, by lengthening the strokes of the adjustable eccentrics, speeding up the machine and putting on a rubber belt. By keeping a straight leg and a curved spring on each side of the machine a panning motion will be obtained, the inventors having thought it advisable to build a machine that could be given different motions and that would work on different principles, in order to enable millmen to experiment and find out what motion is most suitable for their particular class of ore.

The inventor and manufacturers say the machine is simple in construction, requires very little attention and is substantial and durable. The 50-stamp mill on the Grand Victory mine, near Placerville, has recently been equipped with this class of concentrators. They are also working successfully in Grass Valley, and some machines were lately sent to the Bald Eagle mine in Alaska.

The machine is the invention of John Norbom and is manufactured by the Joshua Hendy Machine Works in this city.

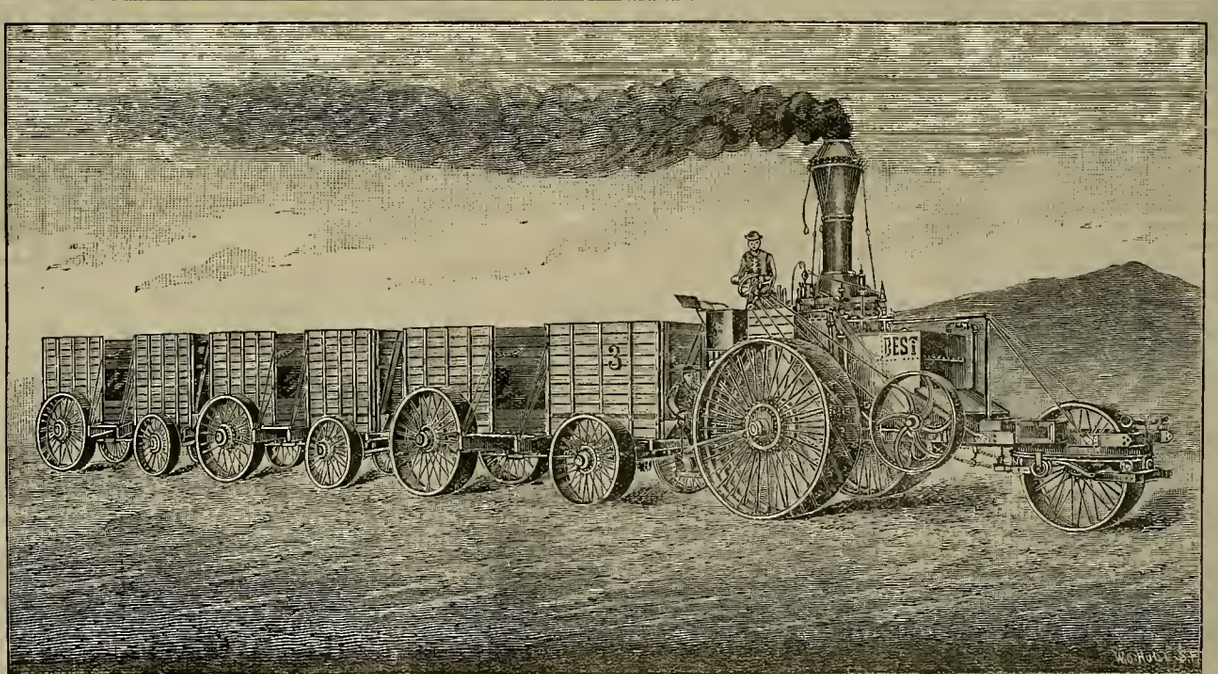
Steam Freighting Train.

ENGINE: 50-Horse Power.

CAPACITY OF TRAIN: 50 to 65 tons; depends upon the roads.

WRITE FOR CIRCULARS AND PRICES.

MANUFACTURED BY



THE BEST MANUFACTURING CO., SAN LEANDRO, CAL., U. S. A.

Scientific Progress.

Water.

Pure water consists of two parts hydrogen and one part oxygen. Chemical name hydrogeu oxide, chemical symbol H_2O. Pure water is a colorless, odorless, tasteless, transparent liquid, and is practically incompressible. Water freezes at 32° F. and boils at 212° F. At its maximum density—39.1° F.—it is the standard for specific gravities, and one cubic centimeter weighs one gramme.

1 U. S. gallon = { 231 cubic inches. / 0.13369 cubic foot. / 8.3311 pounds distilled water. / 8.34 pounds—in ordinary practice.

1 cubic foot = { 62.425 lbs at 39.1° F., max'm density. / 62.418 lbs at 32° F., freezing point. / 62.355 lbs at 62° F., standard temp. / 59 64 lbs. at 212° F., boiling point. / 57.5 lbs. at ice.

1 cubic foot.. = 7.485 U. S. gallons.
1 pound..... = 27.7 cubic inches.
1 cubic inch.. = 0.03612 pound.

A columu of water one iuch square and 2.31 feet high weighs one pound.

A column of watcr one inch square and oue foot high weighs 0.433 pound.

A column of water 33.947 feet high equals the pressure of the atmospherc at the sea level.

One pouud per square inch equals a column of water 2.31 feet in height.

0.433 pound per square inch equals a column of water oue foot iu height.

Water is an almost uuiversal solveut, consequently pure water does not occur in nature. Sea water contains nearly every known substance in solution.

The latent heat of water is 79 thermal uuits. When water freezes it gives off its latent heat. The latent heat of steam is 536 thermal uuits. When steam condenses into water it gives off its latent heat.

An Important Event.

On the 20th of next Juue the canal between the Baltic and North sea will be opened by Emperor William iu the presence of the highest dignitaries of Germany and representatives of other countries. The principal nations will also be represented by meu-of-war. It is expected that the pomp and ceremony will rival the scene at the opeuing of thc Suez canal. Thc Hamburg-American line will join in the naval parade with two of their twin-screw express steamers, the Augusta Victoria aud the Normaunia. A few data in reference to the canal will illustrate the importance of the work. It starts at Keil, on the Baltic sea, and, crossing the Prussian province of Holstein, joins the Elbe at Brunsbuttel, below Hamburg. Work was begun on June 3, 1887, and over 8600 men were employed during the summer months, whilc in winter the number was reduced to about 4700. The plant comprised 90 locomotives, 2473 cars, 66 dredgers, 133 lighters and 55 engines. The estimated cost was 156,000,000 marks ($37,440,000), and the thoroughness of preparatiou and efficiency of execution canuot be better illustrated than by mentioning the faet that the estimate has not beeu exceeded. There will be two locks, one at the Baltic end, opeu all the year round except twenty-five days, and one ou the Elbe, open three to four hours during every flood tide, so that it may almost be termed a tide-water canal. Its length is 53½ miles; average depth, 29½ feet; width at bottom, 72 feet; width at water level, 213 feet. At Brunsbuttel, on the Elbe, there is an outer harbor, 1312 feet long by 328 feet wide; then follows the lock, 492×82 feet, aud 32⅘ fcet deep, aud then an inner harbor, 1640 feet by 656 feet. Two fine suspension bridges cross the canal uearly 138 feet above the water level, so that railway traffic will not be interrupted. The speed allowed ou the canal will be 5.3 miles an hour, makiug the time of passage about thirteen hours. The toll will be seventy-five pfenniugs, or eighteen ceuts, a uet register ton (loading capacity). It is expected that about 18,000 ships will make use of the canal annually, representing about 7,500,000 tons. Hitherto about 35,000 ships have passed every year through the Skager Rack and the Cattegat, between the Baltic and the North sea, so that the estimated percentage seems fair. Thc saving of time will be cousiderable, since for all ships bound to or from any point south of Hull the distance will be reduced by 238 miles. Bremeu ships will save 322 miles, and Hamburg ships 424 miles. But more important than the saving in time is the avoidance of danger, the passage through the sound betweeu the Scandinavian peninsula and Jutland being considered one of the most dangerous in Europe. Statistics show that about 200 vessels founder every year on these coasts. The strategic value of the canal is, besides, of the greatest value to Germauy, becausc its men-of-war will uow be able to pass from the North sea to the Baltic with ease and safety, avoiding the passage through foreign waters, and permitting rapid concentration on the north or the west coast.

THE year 1900 will not be a leap year. Every year is a leap year that is divisible by four, exceptiug those ending iu two cyphers, which must be divisible by 400; thus, 1600 and 2000 are leap years, but 1800 and 1900 are not. Julius Cæsar reformed the calendar by makiug three years of 365 days each follow one year of 366 days, or, in short, every fourth year was made a leap year. This calculation gives an error of about eleven minutes too much each year, which has aggregated uow nearly twelve days. In order to obviate this error Pope Gregory, in 1582, declared October 5th to be October 15th, and made the rule that thereafter century years not multiples of 400 should not be leap years. The Gregorian calendar has been adopted in all civilized countries save Russia. This system of intercalculation recouciles with much accuracy the civil and solar years. The latter contaius 365 days, 5 hours, 48 minutes, 49.62 seconds. By omitting three leap years cvery 400 years it gives the civil year an average duration of 365 days, 5 hours, 49 minutes, 12 secouds, which exceeds the true solar year by 22.38 seconds, amouuting to a day in 3866 years.

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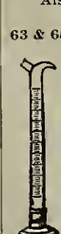

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Mechanical Progress.

Fire Tube and Water Tube Boilers.

In the "Scotch" type of marine boiler, long a great favorite among constructors of vessels for merchant and naval service, the fire passes through the tubes or flues as in a locomotive boiler, and the water surrounds them, being itself contained in a larger shell. But in the "water tube" boiler the fire is on the outside and the fluid within. Regarding the advantages of the latter class of steam generators for use on land or for small craft like yachts and torpedo boats, there is no great difference of opinion. To the introduction of such boilers to big steamships, however, certain objections have been offered; and, as their validity is not universally conceded, there have been some rather warm disputes on this subject among engineering experts during the last three or four years. For the water-tube system it is claimed that, for the same amount of power developed (1) less metal is required; (2) less water needed, both of which features reduce the space and weight; (3) steam can be produced more quickly; (4) the water is more evenly heated; (5) higher pressures may be carried (250 pounds to the inch, say, instead of 150 or 180); (6) repairs are more easily made, and (7) that in case a vessel so equipped is penetrated by a shot from a warship, a less destructive explosion occurs. On the other hand, it is urged that (1) the vaporizing action occurs in a more confined space; (2) the metal surface is not so well protected against the destructive action of the flames; (3) steam is not developed so rapidly with a given heating surface; (4) more fuel is required; (5) the boiler is shorter lived, and (6) that the automatic feed requires extra attention.

This wide difference of opinion imparts interest to the announcement that a Chicago shipbuilding concern is about to make a competitive test of both classes. Two large freight vessels, intended for duty on the lakes, are under construction after exactly the same designs, except that one will have fire-tube and the other water-tube boilers. Engineer-in-Chief Melville, of the United States Navy, has agreed to supervise the experiment, which affords reason for believing that it will be intelligently and fairly conducted. The results will not be decisive of the whole question, to be sure, but they may shed some light on it at any rate.

Iron Cheaper in the United States Than England.

The London *Iron and Coal Trades Review* says: "It is some considerable time since we pointed out that the threat of successful competition in neutral markets on the part of the United States was not a mere 'bogey,' but was likely in course of time to become a stern reality. We have good reason to know that the reality now comes nearer every day. The paper which was read a few days ago before the Middlesborough Chamber of Commerce by Mr. Jeremiah Head pointed in unmistakable terms to the coming supremacy of the United States in the manufacture of pig iron. It was shown conclusively by Mr. Head that in Alabama pig iron is produced and sold for about five shillings per ton less than it costs in Cleveland, the cheapest center of the pig iron industry in this country. It is true that we have not as yet been flooded with this cheap American pig in European markets, but it is not at all improbable that this event will happen by and by. The drawback to the success of the Alabama pig-iron makers at the present time is the comparatively high cost of transport. Situated nearly 300 miles from the sea, and a still longer distance from the great shipping ports, the Birmingham district of Alabama cannot place its produce in many American markets—not to speak of the markets of Europe—for anything like the price at which Cleveland pig can be supplied at home. Whether land and ocean transport will, in the future, be reduced sufficiently to enable a change to be made from this point of view is, of course, an unsolved problem, but the margin of five shillings now in favor of Alabama pig must be increased considerably before we need fear the advent of that product on British soil to any extent worth speaking of. Meanwhile, however, certain other branches of the iron and steel industry have been successfully attacked by our American rivals, under conditions and with an amount of success that may well cause us a good deal of disquietude. We have the most ample evidence of the fact that the cost of steel billets at the works in Pittsburg is cheaper than at works in Glasgow or Sheffield. In other words, the cost of making billets in the United States has been brought down to about 18s 6d per ton, and in some cases perhaps a trifle less, whereas we are not aware of any works in Great Britain where the cost has been brought down under 25s per ton, although, of course, it is possible that it may have been done for something under that figure. That this should have happened in a country where the rate of wages paid is understood to be twenty-five to thirty per cent more than our own is one of those economic problems that are exceedingly difficult of solution. But the effect of the fact is that the American wire manufacturers are making havoc with our English wire trade in Central and South America, and are doing considerable business in Canada."

Photography Under the Sea.

The stupendous progress of maritime science during the last decade made reliable illustrations of objects under water very desirable, and to obtain such pictures photography was, of course, resorted to. It was by no means an easy matter, but with the apparatus herein described the problem appears to have been successfully solved. An ordinary magazine camera, of small size, and adjustable to focus at various distances, is inclosed in a water-tight metallic case, which is furnished with plate-glass lights on each side. Two buttons on the outside of the metallic case work respectively the shutter and the mechanism for focusing. Where the metallic case is pierced a layer of compressed oakum prevents moisture from entering. A metallic tripod of sufficient weight to insure stability completes the outfit. The photographic plates used for this purpose are specially prepared, and are considerably more sensitive than ordinary dry-plates. For certain contingencies a lighting apparatus has been constructed, which for ingenuity rivals the camera. An ordinary magnesium flashlight lamp is fastened to the top of a barrel of about fifty gallons capacity which is weighted down with shot, and also serves as a reservoir for the air supply of the lamp. This lamp is protected by a glass globe, which is fastened hermetically over lamp and spigot, and is also used as a reflector. A rubber bulb containing the magnesium powder and a rubber tube leading to the pointed metal tube in the flash-lamp furnish the means to produce a flashlight by simply pressing the bulb.

The timing of the exposures presents another serious difficulty. At a depth of three to four feet an exposure of ten minutes will give good results; at a depth of fifteen to eighteen feet the exposure should last not less than thirty minutes when the sun is brightest. Even at this depth it becomes necessary to apply a plate of blue glass in front of the lens in order to obtain clear pictures. In deeper regions photography would be impossible but for the flashlight apparatus described above. It saves time and trouble, and good pictures have been taken even during storms and without appreciable light from above.

Wire Silver Produced by Artificial Means.

Professor Phillips, of Alleghany, Pa., is reported to have recently succeeded in obtaining wire silver by artifice. Hitherto wire silver has been known only in nature, and all attempts to reproduce it in the laboratory have failed.

In nature the white metal is found in the form of wire silver, so called because of its peculiar appearance, somewhat resembling fine wire tangled together. Often it looks like moss. Considerable masses of it are sometimes discovered, the minerals with which it was associated having been dissolved out and washed away. Frequently such chunks have been termed nuggets, but there is no such thing as a real nugget of silver.

Silver is exceedingly ready to combine with many other elements, such as arsenic and sulphur. Most commonly it is found associated with the latter, taking the form of a sulphide. Its affinity for sulphur is illustrated by the fact that it quickly becomes much tarnished if exposed in the same room with the contents of a stale egg, the decomposition of which sets free sulphuretted hydrogen.

By Professor Phillip's experiments, he makes wire silver artificially by treating a nitrate of the metal with hydrogen gas.

It may easily be imagined how wire silver produced by artifice might be employed to deceive. The production of wire silver by artificial means is interesting only as a laboratory experiment. No commercial use for it has been suggested as yet.

Money Value of Hands and Fingers.

According to a scale drawn up for the Miners' Union and Miners' Accident Insurance Companies of Germany, the loss of both hands is valued at 100 per cent, or the whole ability to earn a living. Losing the right hand depreciates the value of an individual as a worker 70 to 80 per cent, while the loss of the left hand represents from 60 to 70 per cent of the earnings of both hands. The thumb is reckoned to be worth from 20 to 30 per cent of the earnings. The first finger of the right hand is valued at from 14 to 18 per cent, that of the left hand at from 8 to 13.5 per cent. The middle finger is worth from 10 to 16 per cent. The third finger is valued at no more than 7 to 9 per cent. The little finger is worth 9 to 12 per cent. The difference in the percentages is occasioned by the difference with the trade, the first finger being, for instance, more valuable to a writer than to a digger.

In a recent meeting in England, Alexander Siemens gave some wholesome advice to young engineers and inventors. He dispelled the fable about the circumstances which led to the invention of the steam engine. According to the popular version, Watt, as a small boy, saw the lid of a kettle move up and down when the water was boiling, and this suggested to him the construction of the steam engine. As a matter of fact, Watt made himself acquainted with what had been done before (a point altogether ignored in the popular version), and had to work very hard before he brought his invention to a successful issue. His example is typical of the true method of progress, and it may be said, generally, that, in order to approach a problem with the best prospect of success it is necessary (1) to define as accurately as possible the want that exists, or the particular object to be attained; (2) to be well acquainted with the scientific principles which come into play; (3) to know the want is met, or the object attained in practical life; (4) to find out what proposals have been made by others in the same or in a similar case. A careful attention to these requirements will prevent much disappointment and waste of energy.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AROUND OLETA.—In the vicinity of Oleta gravel and quartz mines are employing ablebodied man.

The principal mine being worked is the Lone Hill. The Davis and J. H. Hill mines are also being successfully operated, the former employing twenty men. All these mines are working channel gravel, similar to the famous "blue lead," and quite as rich. It is not an infrequent thing to turn in gravel carrying from $4 to $5 to the car.

The extent of the lead is not even bounded by section lines, and will furnish work for a generation or two of miners.

The Lone Hill has a fine mill run by hydraulic pressure. The machinery is of the most modern pattern, and has not only a large capacity, but saves every particle of gold. The company has leased the Perrington ditch, lately purchased by D. R. Thomas, and has in this way secured control of the entire water supply.

Eight miles above Oleta the Robertson brothers have struck an eighty foot ledge of porphyry and quartz carrying low-grade ore. It runs from $3 to $4 to the ton, and the proprietors have such faith in the property that they will construct a twenty-stamp mill.

Another new mine is that located by Henry Linton, and known as the Coffey Gulch mine. This lead, while small, produces rock running as high as $1,500 per ton. The mine has not yet been thoroughly prospected, and sinking, it is hoped, will develop a large ledge.

D. R. Thomas, superintendent of the Hill Top mine, now the property of the Interior Development Company of San Francisco, is expecting to commence the construction of one of the largest reservoirs in the State on the old Case ranch at the head of the South Fork of the Consumnes river.

The purchase of the site was made some time ago, but immediate work deferred pending the adjudication of litigation involving large interests in the western part of the county. This reservoir will be the first of a system which will add thousands of inches of water to the old Perrington right, now the property of Mr. Thomas.

Butte.

THE MASCOT.—D. & F. Wyckoff have bonded the Mascot quartz mine at Oregon City and will develop it.

El Dorado.

STANDARD M. CO.—*Democrat:* The Standard Mining Company at Pleasant Valley have their shaft down 130 feet, where they struck bedrock pitching to the south abruptly. In order to get the deep channel they are running south 100 feet, at end of which they will sink a shaft, hoping there to strike the deep channel, where they may reasonably expect to find a bed of rich gravel. This belief is justified by the fact that the surface along the sides of this channel has been worked since early days and paid very rich. Only a few hundred yards from the Standard shaft Mr. John Fink sunk a shaft for the purpose of getting water, and at a depth of twenty-four feet struck a bed of rich gravel ranging in thickness from 2½ to 5 feet. This find of Mr. Fink's is evidently a bench running parallel with the main deep channel. Good prospects are being found on the Volshurg claim, about one mile southwest, and still farther on the same line is the Stevens and McKinney claim, which has been worked to some extent on the vein the present winter, yielding coarse gold in paying quantities, evidently an overflow from the main channel.

Fresno.

A VERITABLE GOLD POOL.—At the confluence of Fine Gold Gulch creek and the San Joaquin there is a deep pool which has one of the largest mining camps on the river located on its banks, though not an ounce of gold is being worked. A dam is being built 200 feet above the mouth of Fine Gold Gulch, and a canal 700 feet long is being cut, through which the waters of the San Joaquin are to be diverted. As soon as the waters of the river are turned the outlet of Fine Gold Gulch will be turned also. It is believed that the whole of the engineering work can be completed by June, and the pumps will clear the pool in which considerable gold is expected to be found.

That there is gold in the pool has been proved by well borings sunk at different spots. The average depth of the sedimentary deposit above the hard bedrock of the river is from five to seven feet.

Nevada.

MINE TO START UP.—*Union:* The Morning Star mine on Gold Flat will be started up about the first of April. A San Francisco company, who bought the mine some time ago, will erect hoisting works and fully develop the property. Mr. Sine of San Francisco will have charge of the mine. The shaft is down about 100 feet, but the company will sink a new one. The ledge is from one to two feet wide and the rock paid $50 and $60 per ton.

A GOOD LEDGE.—*Herald:* In the Blue Jay mine, at Maybert, an eight-foot ledge has been developed, and the rock is of a good quality. Pay rock is being taken out, and the mill will be started when the ditch supplying water is open. The Blue Jay is an example of what may be done by experienced miners, when the strictest economy is practiced. A five-stamp mill, running less than one-fourth of the time for the past year and a half, has paid for itself and the mine and left something for the owners. A twenty-stamp mill and extensive buildings would have swamped the entire business. There are plenty of places where the same system would work equally as well.

THE CENTENNIAL.—The gravel in the Centennial mine, up the Washington ridge, continues to pay, and it may he that the company is to get back the large sums of money they have spent there.

THE BULLION.—Is is expected that the Bullion property, comprising the lone and Galena, at the base of Osborn Hill, on the Colfax road, two miles from Grass Valley, will have work resumed shortly under the superintendency of Geo. Mainhart.

WHITE HORSE DISTRICT.

The Sunset mine continues idle, no work being done in the shaft this spring.

Senor Ortega has succeeded in raising $4000 to build a mill on the Addie C mine.

The Emma L has not advanced any, as the water from melting snow has been had in the tunnel. The Emma L company expect to rebuild and start their arrastra soon.

The J. G. Blaine continues to be the largest operating mine in the district. A drift is being run south now from the first station in the east drift. It is the intention to run 100 feet in that drift, and timbers are being made ready for that purpose. The superintendent has shown some rock that will assay $100 per ton.

Plumas.

THE THISTLE MINE.—*Independent:* The Thistle drift mine now employs 100 men and is a good gold prodneer.

QUINCY MINING AND WATER CO.—*National Bulletin:* Supt. A. B. White arrived from helow last week, via Reno, and proceeded to Spanish Ranch. Foreman Campbell, for several weeks past, had been getting things in readiness for active operations. During the past few days Mr. White has been employing more men for the purpose of getting the water started through the ditches and into the pipes. The washing of gravel will begin as soon as this work is accomplished, and will continue through the entire water season, which promises to be a very lengthy one—unusually so in consequence of the immeuse banks of snow lying around the base of Spanish Peak, which is drained by the large water system of the Quincy Mining and Water Co. The operations of this company will furnisb employment for quite a crew of men during the spring and summer. The area of gravel deposits is very large, and from those worked in years gone by very large sums of gold were taken. It is believed that fortunes remain in the unworked gravels of the ancient river channels which thread the territory owned by the company. The corporation is well equipped for successful mining. It has one of the most extensive and effective water systems to be found in this part of the State, and on its own lands is plenty of timber for all purposes pertaining to the mine, and should it ever desire to engage in that line of busines, it will be ahle, with its facilities of developing water or electric power, to convert into lumber the large forest of valuable timber on the slope, extending from the base of Spanish Peak dowu to points north of Quincy. On the arrival of the railroad, which has already been partially built into Plumas and which will he extended this spring and summer, lumber could he shipped to profitable markets.

GULLIC & COMPANY. — B. F. Gullic is expected to return from Illinois to Greenville, this county, in a short time, accompanied by his family. He will at once proceed in the work of erecting a 20-stamp quartz mill on the Hibernia properties, near Greenville; on which his compauy did much development work last fall, the results being very satisfactory. It is probable that, on this property, thirty or forty men will be emyloyed during the coming season. The Hibernia and adjoining mines, owned by Gullic & Co., are south of Greenville and in the mountain so fruitful of gold-hearing quartz veins. That they have a valuable property, the owners have no doubt. They made a milling test of the ore last fall and the yield proved so satisfactory that a purchase of the property was made and the improvements referred to determined upon.

THE BUTTERFLY MINE.—The Butterfly mine is now being operated under the management of Prof. C. D. Kellogg, who last fall interested Eastern capital. A ten-stamp mill has just been completed and the crushing of ore has begun. In the work of preparation the management has had a severe winter to contend with, but much pluck and energy have been manifested, and now the wheels are rolling.

McGill and Standart will resume work on their mine near Greenville as soon as the absence of snow will permit.

The Trelcaven brothers are expected to open up the old New York mine at Greenville in the near future. It is a property which has produced considerable money.

B. F. Leete, of Reno, Nevada, expects to do considerable development work on his quartz mine near Cresecent during the coming season.

Work on the Lucky S. mine has been resumed, but only a small force will be employed until the conditions of weather favorable to work have arrived.

The indications are that Granite Basin will be a lively mining camp this year.

The Pioneer mine at Grass Flat, near Port Wine, will soon have a large force of men employed.

Siskiyou.

HAWKINSVILLE AND YREKA.—Mining operations at Hawkinsville this spring and summer will make Hawkinsville and Yreka lively. In Yreka not a dwelling house can be procured for rent, many persons being obliged to buy, while others in want of residences intend building.

The thirty-ton pump for raising water from the electric light ditch at Shasta river, to work mines at Hawkinsville, is at Yreka, on its way down to the river via the Hawkins road. It will force water to a hight of nearly 500 feet through 1100 feet of large pipe, in supplying a dich for working the diggings near Hawkinsville in the Yreka basin.

GENERAL MINING NOTES.—*Journal:* Work has been progressing all winter in the cinnabar mines on West Beaver Creek, Siskiyou mountain, by tunneling. When the snow disappears the ore will he retorted.

The Spangler Bros., at mouth of Humhug creek, have succeeded in getting their diggings pumped out, by having a pump some distance above their pit on the creek, and another at the pit, so as to permit hoisting pay gravel.

The McConnell and Pacific river claims in the Klamath, just helow the mouth of Humbug, are to he worked on an extensive scale this season. A long wingdam is to be built for covering both claims, which are adjoining on an island, and will be pumped out under the superintendence of Marsena Mott.

Brown & Hossick have struck a high-grade ochre quartz mine on the middle fork of Humhug, about ten miles from Yreka, which prospects over $35 per ton. The ledge is about five feet in width, and there is an abundance of good paying quartz in sight, to be crushed shortly in McCook's mill at the forks of Humhug.

Clark & Callick have fifty tons of quartz already taken out of their ledge on Old Craggy mountain at Humhug, the rock being of a milk-white character, and yielded at last crushing an average of $21 per ton.

Coulson & Lash have a good ledge on the midddle fork of Humbug, with considerable rich ore in sight.

Elliott Creek, up in the Siskiyou, close to the Oregon line, seems to be a rich placer mining district, as several claims have been lately taken up there, near the headwaters of Cettonwood creek.

The Eastliek Bros., says the Scott Valley *News*, started up work in their hydraulic mine at Oro Fino last Friday. The electric lights recently put in did not work satisfactorily, and the old-fashioned torch is being used while the e'ectric plant is being overhauled and corrected.

Sierra.

GENERAL ITEMS.— The Ruby mine is at present employing eighteen men, and is not on a paying basis. At the Gold Valley nearly forty men are employed. Fifteen stamps are constantly running at the mill. The Alaska mine at Pike City has about fifty men at work, and is getting out rich ore.

THE GOLD VALLEY.—The Gold Valley mine is now in full running order, with nearly forty men employed. They have begun crushing ore in the mill, and fifteen stamps are continually kept running. A. Maltman has charge of the cblorination works.

Shasta.

IRON MOUNTAIN MINE.—At the present time there is little doing. The mill is idle, waiting for wood, a contract having been let. The mountains have been laid hare of timber for several miles around the mill.

A new tunnel has been started lower down and pushed in some 135 feet. A crew of men are also at work extending the boarding-house. The survey for a railroad track to connect with some point on the river is progressing.

WINDY CAMP.—S. Weil has been working on the sale of the Windy Camp property. The transfer has been made, but there are a few matters to settle as regards title. The purchasing parties will expend some $100,000 on the property as soon as a clear abstract can be shown.

THE EUREKA TELLURIUM.—*Free Press:* The Eureka Tellurium or Scherer mine and works will start up April 1st under the superintendence of Mr. Murdock. W. D. Swezey, the president of the company, will also give the mine considerable attention.

FRENCH GULCH.—The Gladstone mine is running twenty stamps and employing forty-five men. The ore averages well and the mine is in a prosperous condition.

The old Washington has a very rich ore body and is making hullion faster than at any time in the last twenty years.

Parties working in the Niagara report a phenomenally rich ore body.

The Myers miue is also running on some high-grade ore.

Wm. Stevens, who has been erecting the mill for Ellery Bros., reports the mill ready for operation. It will probahly he started this week.

Parties down from Trinity Center report the snow fast disappearing, and in a short time the country will he full of prospectors. Jack Strode continues to pile up rich rock, and the indications are that this district will produce between $200,000 and $300,000 this season.

The Minnesota mine on Spring creek has made arrangements to run through 200 tons of ore from Foster's mine.

Jack Karmeen reports matters at the Hidden Treasure very satisfactory. The mill erushes thirty tons daily.

Col. Jack Stowell is negotiating the sale of his claims to an Eastern syndicate.

The Uncle Sam has been using water power to run its mill since September, and from present appearances will not need steam before July. Supt. James shows some fine ore chutes as the result of last year's work.

OLD DIGGINGS.—Hart's Texas & Georgia is running twenty stamps as usual. A long tunnel to tap the lower levels is in progress.

Quartz Hill is to be under the management of Assayer Luckhart of San Francisco. The mill will he started soon.

OTHER DISTRICTS.—W. P. Miller's mill at Middle creek laid still two days this week on account of a broken rock-breaker.

John Doeblin, near Muletown, made a nice cleanup from his gravel claim. It paid from $8 to $10 per day to the man. With plenty of water this claim would be very productive.

Chapman & Voluntine have their hydraulic working and are doing effective work on Clear creek. Their ground ought to yield from $12,000 to $15,000 a month.

Charles Jones has his new mill running at Muletown.

Judge Reed of Igo is examining a new quartz find on Oak Run, thirty-five miles east of here, and will move his Huntington mill from Igo over there. The ore is free milling and averages $20 gold per ton. The ledge is eight feet wide and no waste in it.

Work is to be resumed on Oregon gulch drift diggings next week.

Trinity.

FISHER GULCH.—*Journal:* Messrs. Ralston & Spencer, who have a lease on the Fisher Gulch and Bonanza quartz mines in the Canyon Creek mining district, are prosecuting work on these properties.

DEADWOOD.—Charles Gilzcan has struck a very rich ledge. It is about 800 feet south of the Brown Bear mine. The ledge is small, but very rich, the gold being coarso and heavy.

J. N. McDonald, Tom O'Keefe and J. H. Blagrave commenced work this week on their lease in the Last Chance stopes.

Wm. A. Blagrave has discovered the western extension of the Brown Bear ledge. He has a lease on it, and is running a tunnel to tap it under the big slide north of the Brown Bear mill.

The Brown Bear Dump Co. started up their mill the latter part of last week and are running full time. The result of their last run was not satisfactory. They drove their tunnel farther under the dump, and from all indications their present run will prove satisfactory.

NEVADA.

STRIKE AT KENNEDY.—W. A. Nixon has made a strike in French Boy canyon. Assays of the ore run from $2000 to $4000 per ton and the ore chamber seems large. Considerable of the ore has already been taken out.

LYON COUNTY.—The *Times* says that C. T. Martin and W. H. Spragg, of Mason valley have discovered some pretty fair gold prospects in Mason valley, about six miles to the southwest of Yerington. The deposits are in the range of hills lying between Mason and Smith valleys, and are about two miles from the Walker river. Other prospectors have discovered gold in that section. It is low grade material, but the indications are that there is considerable of it as the ledges are large.

ON THE COMSTOCK.—Con. Cal. and Va.—1650 level—On the sixth floor in the new ore body, the second floor helow the sill floor of this level, the east crosscut started at a point 125 feet south of the vertical winze which connects with the 1600 level has been extended 26 feet, to a total length of 65 feet, passing through a quartz formation assaying $10 per ton, and reaching the old stope timbers. At a point in the south drift on this floor 85 feet south from the vertical winze a west crosscut was started and has been run 20 feet through low-grade quartz to the west or footwall. On the ninth floor the drift running south from the south end of the stope has been advanced 34 feet to a total length of 99 feet, its face being in porphyry. On the twelfth floor the east crosscut has been extended 5 feet to a total length of 70 feet, with its face in porphyry and low-grade quartz. From this east crosscut, to a point 18 feet in from its mouth, two drifts have been run, one to the north in low-grade quartz 12 feet, and the other to the south 9 feet in a formation carrying narrow streaks of ore which give an average assay value of $22.70 per ton. An opening has been made from the thirteenth floor up to the fourteenth floor 10 feet long and 6 feet wide, through low-grade quartz, porphyry and some clay. The stope started from the south drift, from the east crosscut, from the main north lateral drift, on the sill floor of this level at a point 20 feet from its mouth has been carried up 7 feet to a total height of 22 feet. This opening is 10 feet long and 6 feet wide, through ore 6 feet in width, lying against the west wall, and carrying on the average an assay value of $60 per ton. 1750 level—From the end of the drift running south from the south end of the stope on the fourth floor two crosscuts have been run, one to the east 15 feet through porphyry and quartz of low assay value, and the other to the west 9 feet through low-grade quartz to the west wall. A small portion of the ore extracted during the week came from the thirteenth floor above mentioned and the remainder from the opening made from the south drift from the east crosscut on the sill floor of the 1650 level, amounting to 52 tons, which assayed per car sample $46.92 per ton.

In the Ophir mine during the week the usual prospecting work was done in the 1465-foot level openings and in the old Central tunnel region. Most of the openings are in porphyry and low-grade quartz.

In the Hale & Norcross mine a west crosscut was started near the north boundary line on the 975-foot level and advanced 12 feet. The face is in porphyry and quartz. The south drift from the west crosscut No. 1 on this level was extended 8 feet to a length of 76 feet, and the face shows a narrow streak of fair-grade ore. On the intermediate level they have stopped work in the north drift and advaneed the south drift to a length of 31 feet. In it are porphyry and stringers of quartz. They extracted during the week eight carloads of ore averaging $29.68 per ton.

GOLD-BEARING QUARTZ.—William Ross, who has been prospectiug in the Fox range of mountains, about twenty miles north of Pyramid lake, says he has discovered a lead that is over one hundred feet wide, and that can be traced by croppings for over four miles. The formation in which the lead is situated is porphyry on the hanging wall and slate on the foot wall. The trend of the lead is almost due north and south, with a dip to the west. The ore has a bluish tinge, contains a high percentage of granite and contains consider-

able gold. The ore is free from base metal and sulphurets, the gangue being quartz and graphite. Assayers say it can be worked by ordinary mill process, as the gold is free. Samples of the ore have been taken to the State University. There is an abundance of wood and about fifty inches of water, with plenty of fall. The mine is about eighty miles due north of Reno, and is about forty miles from the terminus of the N. C. O. at Amedee. The owners are William Ross, Frank Dickinson, Seeley Trumbull, William Frost, James Sutcliffe, J. A. Bonham, J. F. Bonham, John Raser, Homer Bonham and B. F. Dickinson, who have located about 5000 feet of the lead.

ARIZONA.

SANTA MARIA COPPER MINES.—*Courier:* J. A. and F. A. Healy have sold their group of copper mines on the Santa Maria to San Francisco parties for $30,000, cash down. The group is located about eighteen miles below the Goodenough camp. The purchasers will work the mine on an extensive scale.

G. A. R. MINE.—Mohave *Miner:* Report comes from White Hills that an immense body of silver ore has been encountered below water level in the G. A. R. mine, owned by the White Hills company. Samples from the vein run over 1100 ounces in silver and four ounces gold per ton. This is the first strike of ore that has been made below water level and proves that the mines go down.

GOLD EXCITEMENT STAMPEDE.—There is reported from Jerome, an account of a strike of gold rock in one of G. W. Hull's mines, two miles south east of Jerome. The pay streak is fifteen inches in width and, it is asserted, runs $2,000 gold per ton. Over 100 people are camped on the ground and more coming in the same vicinity.

THE HOWELL.—The Howell mill is now being run day and night on ore from the Shelton mining group, on upper Lynx Creek, the Shelton people having made arrangements with Mr. Morse to mill their ore pending the arrival and erection of their fifteen stamp mill.

THE RIPSEY SHUT DOWN.—*Silver Belt:* The Ripsey mine, near Riverside, of which great expectations were entertained, has shut down after a few days' run of the mill, sufficient to demonstrate the fact that the ore could not be made pay. A few men are retained to run a drift in short distance, on the 300-foot level, to the ledge. If pay ore is not encountered there all work will stop.

For the past eight or nine months the company has been working a considerable force opening up the mine. A mill was erected on the Gila, four miles below Riverside; also a store and boarding-house and cabins for the employes. The expenditures amounted to about $70,000. All the appointments are complete and first-class; all that is lacking is pay ore.

It is another instance of building an expensive plant before a mine has been found to supply the ore. It is not a new experience. Unfortunately, it has been far too common in the West, and Globe district has experienced the same disappointment more than once, and is still feeling the evil effects of those disasters.

Every such blunder works harm to the mining industry.

OREGON.

WILL PUMP DIRECT.—The Tolo Mining Co. have switched on their idea of getting water on their placer mines with a flume, after spending considerable time and money in the endeavor, and will pump with steam from Rogue river direct. The flume built will be used for running tailings into the stream.

Josephine Co.

BOUGHT A MINE.—Ex-Collector of Customs Quinn, of this city, has bought the Hammersley mine in Jump-off-Joe precinct for $25,000.

Jackson Co.

THE ASHLAND MINE.—Capt. Jas. Carroll is having the Ashland mine experted. His option on the property expires next week.

BRITISH COLUMBIA.

LARDEAU CREEK.—The placer diggers on Lardeau creek are doing well, says the Revelstroke *Mail*. Charles Matheson picked up a splendid specimen a few days ago valued at $15. John Knowles has some splendid samples of gold, about $300, in nuggets, ranging in value from 25 cents to $10, and which he has taken out of the creek in the last few months.

IDAHO.

THE TIGER PUMP.—The Tiger Company is now putting in the heaviest pump that has so far been introduced into the Cœur d'Alenes. This will be on the ninth level, and will pump 600 gallons of water per minute to a height of 750 feet. The discharge pipe is nine inches in diameter. Altogether there are 75,000 pounds of machinery included in the pump and its connections. It is of the Reidler plan, and was furnished by Fraser & Chalmers of Chicago. At present the Tiger mill is working only one shift—the mine two shifts. It is doing very good work, and turning out concentrates of a very good grade. About sixty-five men are employed.

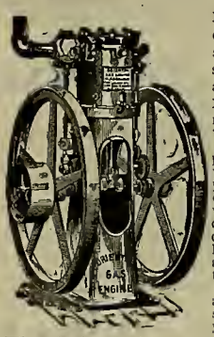
THE CŒUR D'ALENE.—Five loads of concentrates are sent in over the Cœur d'Alene branch each day from the Poorman and Gem mines and the other mines, except the Bunker Hill and Sullivan, are contributing their share of the business. There is some activity in nearly all of the mines now and the branch lines of the Northern Pacific are in better condition than they have been at any spring since the Cœur d'Alene was completed. The average depth of snow on the range last winter was only three feet, where it was from ten to sixteen a year ago. This snow has melted gradually this spring and there has been no material damage to the road.

SOUTH DAKOTA.

THE HOLY TERROR.—*Pioneer:* The Holy Terror mine is cleaning up fully $2,000 per day from their small stamp mill. The ore at the end of the drift is as rich as it was in the tunnel, and is now in about thirty feet. The rich streak continues all the way in and shows no signs of petering out, but is gaining in width. The owners have a fortune and are quietly working away and milling the rock. They ship to the mint at Philadelphia. The batteries of the mill have to be cleaned every night. The owners claim now to have enough ore to run the stamp mill for four months. A collection of forty-eight specimens sorted from the ore sent up were divided into four piles, one for each of the owners, who cast lots for first choice. The one who gained the first pick was at a loss to choose, as they were all very rich.

The clean-up for the forty-eight hours ending Tuesday night gave an even $8,000, or $1,000 a day.

The Oriental Gas Engine



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Electrical Progress.

Electric Lighting in Mexico.

There are not yet many electric lighting plants in Mexico, and those now running have usually some feature out of common. That, for example, at Aguas Calientes is interesting. While successful in every way, it could not depend on its regular street and commercial lighting for an income. The earnings of the company for any particular month can be estimated with a fair degree of accuracy from the number of saints' days on the calendar. The station is so equipped as to supply churches with extra light at short notice, and often from 200 to 300 lamps are put into one church temporarily at a lucrative price. The six largest churches of the city are lighted by the company. Last Christmas time large crowds poured into the Cathedral to witness the special illumination. In the center of the altar was a life-sized figure of Christ. Radiating outward from this central figure were strips of silver gilt, and at the point of each of the radiations was a sixteen-candle power lamp. An additional 200 lamps were employed in a large inscription of the word "Maria." The effect was striking and the people were delighted. But the time when the resources of the station are most severely taxed is the feast of San Marcos. The Mexicans are born gamblers, and San Marcos is the great gambling feast of the year. Between the 20th of April and the 10th of May visitors flock into the city from all parts of the country to the number of 60,000 or 70,000, and among these there is a liberal admixture of American and European travelers. The city is given up to high revelry, and all gamble from high to low, according to their financial capacity. The headquarters of the play is the Hotel de San Marcos, where special apartments are gorgeously fitted up with mirrors and upholstery, and brightly illuminated with novel lighting designs. Around the tables are to be seen the youth, beauty and wealth of Mexico, and the game goes on night and day. Moreover, the celebrated San Marcos gardens are specially wired for colored lamps, and the whole scene is fairyland. Even if somebody "breaks the bank," the electric light plant comes out ahead. Two other curious features distinguish the plant. It uses wood for fuel in preference to coal at $15 a ton, and the station hands are paid daily for fear the affluence and opportunities of a whole week's wage all at once should be too much for them.

Electric Life Buoys.

A large electric company of Berlin, Germany, is making a life buoy for use on shipboard, which is fitted with an electric lamp so as to be visible at night in the water. The floating apparatus is made of waterproof linen, and is sufficient to bear the weight of three persons in the water, life belts being attached to the buoy. Inside the canvas buoy is a double wooden box containing an accumulator with gelatinous electrolyte, and it is capable of feeding an incandescent lamp for six hours. The incandescent lamp surmounts the floating buoy in a strong wire frame, and is further protected by an outer strong glass globe. When the apparatus is hanging on board ship, the weight of the lower portion automatically switches off the current, but as soon as the buoy is released and dropped into the water four powerful springs switch the current on. The accumulator will last for two months before requiring to be recharged, so that the apparatus can be employed on board ship where there is no dynamo. The apparatus weighs 100 pounds, but the accumulator can be made lighter, with, of course, a corresponding decrease in the duration of the light. A further and promising form of electric life buoy has now been proposed in the nature of a dirigible craft, such as have already been used successfully in warfare. It carries a motor and a reel of wire, and can be directed towards wrecks or any one struggling in the water. By reversing the motor can be made to rewind its wire or to come home with its burden. By day it carries flags, and by night its location is marked by an incandescent lamp on it. Any ship or life station that has an electric light plant can operate from deck or shore this life saver, and it is believed it will soon find its place among the best appliances of the kind.

Electric Light Photography.

Mr. Adamson, of Glasgow, Scotland, has been exhibiting a photographic apparatus using fifty-candle power incandescent lamps, about forty in number, arranged in a circle inside an umbrella-shaped reflector. The lamps are run up to double or treble their normal power at the moment of exposure. This, as every electrician knows, will not only blacken the lamps at once, but shorten their life at the same time. The arc lamp is now so perfect, its light is so much better than daylight for portraiture work, and the cost of maintenance and for current so small compared with that of the incandescent system, that the experts fail to see the reason for the adoption of incandescent lamps for such a purpose. Perhaps the greatest use of the arc light in photographic work now occurs in American newspaper offices, where resort is made to free illustration. The speed and neatness with which the latest sketches from the seat of war, crime or disaster are thus converted into blocks and are run through the press alongside type is considered marvelous by foreign journalists.

One of the highest medical authorities in England made a merited attack upon the medical electrician in a lecture delivered by him on February 11th before the London Institution. Taking as his subject, "Truth and Falsehood as to the Effect of Electric Currents on the Body," he showed the present state of our knowledge regarding the subject. Referring to the effects of the various currents on nerves, he showed a number of experiments and quoted Galvini's celebrated frog experiment. Some of the "quacks" advertise their electric belts and such wares in the stereotyped phrase, "Electricity is the Life," and Prof. Horsley showed the falsehood and deceit therein contained. The only legitimate purpose for which an electrical current could be used in medicine or surgery was to stimulate or call out action in some particular muscle, or to stimulate some other physiological action, such as secretion. But the currents required to do this must be powerful and intense. After speaking in very strong terms of C. B. Harness's Company and its quackery, he referred to electrical quackery having had to be slaughtered by public-spirited private individuals instead of by the real public prosecutor, whose real duty it was.

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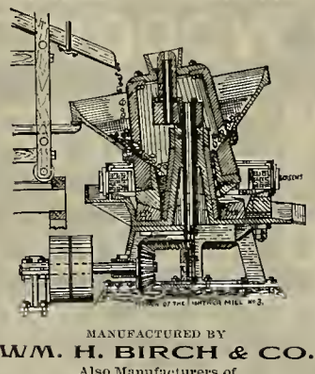

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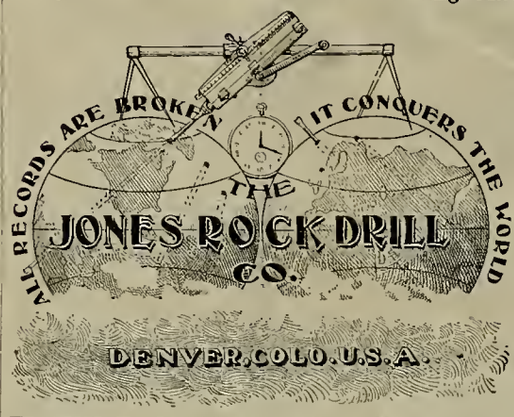

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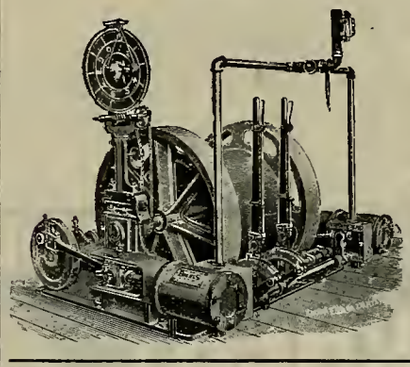

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The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XXV.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

From a letter dated Castel-a-Mare, ancient Stabiæ, September 2, 1794, by the same author, the following is quoted:

"Within a mile of this place, the mosetei are still very active, and particularly under the spot where the ancient town of Stabiæ was situated. On the 24th of August a young lad, by accident falling into a well that was dry, but full of mephitic vapor, was immediately suffocated. There were no signs of any hurt from the fall, as the well was shallow. This circumstance called to my mind the death of the elder Pliny, who most probably lost his life by the same sort of mephitic vapor on this very spot, and which is very active after great eruptions of Vesuvius."

There is a similar locality at Amsanctus in the ancient province of Samnium, at the temple of Mephitis. Virgil has made this locality famous in the following verse:

"There is a place, amidst Italia's land,
Of note illustrious, beneath mountains high,
Sounded aloud by fame through many a clime,—
The valleys of Amsanctus:—these with boughs
Dark buried on each side, a wood hangs o'er,
And in the midst a roaring cataract,
'Mongst rocks, with giddy whirlpools hoarse resounds.
Here a terrific chasm is shown, deep vent
Of ruthless Pluto; where a vortex vast,
From bursten Acheron pesrif'rous yawns:
Therein Alecto, now-abhorred name!—
Plunging rom sight, disencumber'd earth and Heav'n."
(Eneid, book VII, 708.)

In "The Natural History of Vesuvius, 1743," before quoted, fol. 195, may be found a very detailed account of the "mossetto". First Grotto del Cane is described: "Such is what we call the mossetto, of which we have others in the neighborhood of Naples and in different parts of the kingdom. * * * * The Lake of Averno might anciently pass for a kind of mossetto, for the Greeks gave it the name of 'aorne' because its exhalations were so pestilential as to kill the birds that accidentally flew across it (aorne signifies a place without birds, or which the birds shun or dare not pass without danger). * * * * We call, then, a mosetto, a steam which is deadly to all animals that remain in it, that extinguishes a flame suddenly, not by its stench, nor coldness nor heat, nor any visible or apparent quality, but from some occult cause which our senses cannot discover" (fol. 196). "We say that this vapor extinguishes the flame, for you no sooner let down a lighted torch or candle into its atmosphere than it goes out as suddenly as if plunged into water (fol. 197). * * * We shall say nothing of a third kind of exhalation which we may call 'artificial mosetti,' such as the steam of new wine when in the fat, that of several chemical mixtures, the steam or smell of charcoal or sulphurous coal and, lastly, the nuisance of air when long pent up in the same compass (fol. 198). Our peasants know the mosetto or pestilential exhalation by several marks—sometimes the grass is violently agitated, chiefly in those places that serve as vents to the exhalation; sometimes the plants appear all dead and withered by the malignity of its venom; and sometimes they know by the birds, lizards and insects which lie smothered in its course (fol. 200) * * The method we took to discover their course and extent was by light and torches we carried with us. These, when held in the atmosphere of a mosetto, immediately went out and the smoke pointed the direction of the exhalation. * * * * We made some experiments on water tainted by our exhalations into which we put several sorts of fish. Undoubtedly they felt some pain, for they darted about with surprising velocity and signs of uneasiness, often thrusting their heads above the surface, which they seldom do when the element is pure. Eels and frogs seemed to bear it better, though they seemed like the others to be quite spent and lay on the surface with their bellies turned up as if dead. Whether the water purged itself from the contagion soon or from some other cause, they all revived (two or three eels excepted), and being removed to clean water, soon grew as well as ever (fol. 213)."

Daubeny refers to the mosetti in southern Italy: "About a mile to the east of Mount Vultur, in a place called 'Rendina,' is a mosette or exhalation of some noxious vapor which produces a sharp, smarting sensation on the organs of sight, smell and taste and causes a fainting in those who breathe it freely. * * * * There is one spot, however, in the midst of a torrent which flows along the valley, called 'Vado Mortale,' from the nature of the mosette existing there. This, which is carbonic acid, attains usually to the height of four or five feet, so that it is constantly fatal to animals that pass the stream at that point." (Description of Active and Extinct Volcanoes, (fol. 141–143.)

The phenomenon of dying fish is repeated in California, many being from the same cause killed in Clear and Buena Vista lakes.

(To be continued.)

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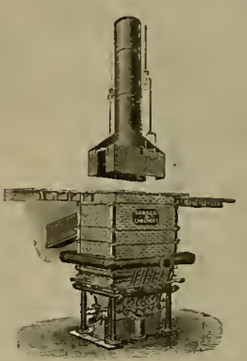

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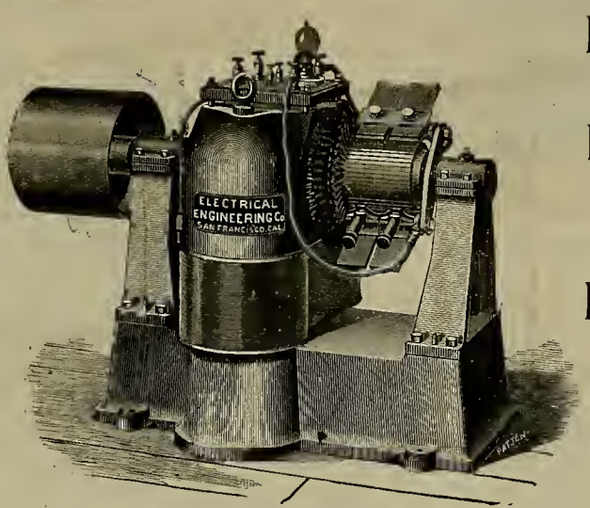

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Market Reports.

The Markets.

SAN FRANCISCO, March 21, 1895.

The rise in silver is variously accounted for —the adjournment of Congress, the monetary conference, the attitude of Germany, the Japan indemnity are among the causes assigned. It is probable the real reason is the recognition by England of the future futility of attempting the continued demonetization of silver, the hoarding in anticipation of the terms of the payment of China's war debt to Japan, which is practically the usual matter of supply and demand. Like everything else, the question will work itself out.

New York Metal Market.

NEW YORK, March 21.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.
COPPER—Brokers', 9.35c; exchauge, 9.35c.
LEAD—Brokers', $3.00; exchange, $3.10
TIN—Straits, 13.90@14.10c.
SPELTER—Domestic, $3.12½.

New York Prices.

NEW YORK, Mar. 21.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	28⅛	61⅜	9 40	3
Saturday	28⅛	61⅜	9 35	3 00
Monday	28¼	62	.....	.....
Tuesday	28¾	62⅞	.....	.....
Wednesday	29	63⅜	9 35	3
Thursday	29	62¾	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sigbt Draft	10c
New York Telegraphic Transfer	12½c
London Bankers' 60 days	$4.88¾
Loudon Merchants	$4.86
London Sight Bankers	$4.89¾
Refined Silver, per ounce	62¾c
Mexican Dollars, nominal	52½@53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sbeatbing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	6 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
Englisb, lb	14	@	16
NAILS.			
Wire			$2 90
Cut			2 65
PIG TIN.			
Per lb	15	@	16 00
ZINC.			
Sbeet	8¼	@	
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sbeet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* tban B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			10 00
Egg, bard			12 50
Wallsend			7 00
Scotcb Splint			7 50
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotcb Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lebigb Lump	16 00	@	— —
Cumberland	11 00	@	— —
Egg, bard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'		75c	₽ bbl
Englisb, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO — WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, March 21, 1895.

The market opened weak, with some improvement during the week, there being nothing of note in the daily transactions. The rise in silver will first favorably affect the Comstock and other "going" silver properties, as there cannot be expected any general resumption of work in suspended silver mines till there is assurance that the present advance is something more tban a spurt.

There is a new find of ore in Occidental Con., and the north drift from the west crosscut, 500 level, continues in $40 ore.

The directors of the Holmes Mining Company have ratified the contracts with the syndicate of Chicago and foreign capitalists, referred to in last week's issue, for working the tailings and low-grade ores of the company and also cleaning up its mills. Work will shortly begin at Belleville.

The Gold Run Placer M. Co. has bought the mines of that name south of Golcouda, Nev.

Salt Lake parties are again reported to have bonded some Meadow Lake mining claims for $50,000.

Bewing, Moreing & Hooper, of London, are reported uegotiating for the Rawhide mine on a million-dollar basis.

At the auuual meeting of the Chollar Mining Company 98,822 shares were represented and the following officers elected: A. K. P. Harmon, president; Thomas Cole, vice-president; and Thomas Anderson, D. C. Bates and E. P. Barrett, directors. Charles E. Elliott was re-elected secretary. His statement showed a credit balance of $7157.82. H. M. Gorham was re-elected superintendent. His report showed that the company made $800 over all expenses during the past month.

The following illustrates the changes of the week:

MINES.	14	21
Alpba	$ 10	$ 08
Alta Consolidated	32	25
Andes	29	.....
Belcber	.....	.....
Best & Belcber	91	89
Bodie	1 40	.....
Bullion	.....	21
Cballenge	.....	39
Cbollar	53	51
Confidence	1 50	.....
Consolidated California and Virginia	2 80	2 85
Consolidated New York	.....	.....
Crown Point	41	43
Exchequer	04	.....
Gould & Curry	53	.....
Hale & Norcross	98	1 15
Justice	18	.....
Mexican	92	90
Opbir	1 80	.....
Overman	15	16
Potosi	.....	.....
Savage	39	39
Sierra Nevada	82	80
Union	58	.....
Utab	07	.....
Yellow Jacket	57	56

San Francisco Stock Board Sales.

SAN FRANCISCO, Marcb 21, 1895.

9:30 A. M. SESSION.

100 Alpha Con	08	350 Hale & Norcross	1 15
100 Alta	25	100 Mexican	89
100 Best & Belcber	89	50	90
100	88	100 Savage	39
100 Bullion	21	500 Occidental	09
100 Cbollar	51	150	08
50 C. C. V	2 80	100 Sierra Nevada	80
100 Crown Point	43	50 Yellow Jacket	56

SECOND SESSION—2 P. M.

200 Alta	25	100 Crown Point	40
200 Bullion	21	100 Eureka	10
200 Bulwer	20	300 Kentuck	04
100 Cballenge	39	500 Occidental	08
100 Con Cal & Va	2 85	300 Overman	16

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING MARCH 12, 1895.

535,662.—FRUIT EVAPORATOR—A. H. Blackburn, Petaluma, Cal.

535,663.—CHIMNEYS—A. H. Blackburn, Petaluma, Cal.

535,673.—LOCOMOTIVE—M. B. Bulla, Yuma, A. T.

535,674.—BICYCLE—C. A. Coey, Fairfield, Wash.

535,683.—ORE CRUSHER—W. G. Dodd, S. F.

535,684.—CAR COUPLING—W. Dunlap, San Diego, Cal.

535,694.—CAN HEADER, ETC.—J. W. Gbeen. Portland, Or.

535,445.—PHONOGRAPH—L. W. Glass, S. F.

535,588.—FOUNTAIN PEN—P. D. Horton, Oakland, Cal.

635,541.—BATTERIES—A. Hougb, S. F.

535,805.—RAILWAY TOOL—B. Molloy, Golconda, Nev.

535,718.—RESPIRATOR—R. Nagler, S. F.

535,770.—WOODEN STOPPLES—R. F. Ridebaugb, Tacoma, Wasb.

535,771.—CUTTING MACHINE—F. J. Richards, Needles, Cal.

535,742.—LADDER—Tbos. Sooy, Gridley, Cal.

535,424.—DRAG SAW—A. T. Stimson, Bayside, Cal.

535,634.—CHIMNEY CAP—F. C. & H. A. Stober, Sacramento, Cal.

535,635.—CARD RECEIVER—J. T. Stone, Oakland, Cal.

535,472.—PUNCH AND DIE—N. Troyer, Astoria, Or.

535,474.—EGG BEATER—C. H. Warrington, Stockton, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

THE CALIFORNIA DEBRIS COMMISSION having received an application to mine by the hydraulic process from George Wheeler, in the Grizzly Flat Mining Claim, El Dorado county, Cal., to impound tailings behind brush dams below the mine, gives notice that a meeting will be held at room 92, Flood building, San Francisco, Cal., April 1, 1895, at 1:30 P. M.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Belcber S M Co, Nev	50	25c	Mar 5,	Apr 9, Apr 30	C L Perkins, 309 Montgomery
Booth G M Co, Cal	5	2c	Feb 18,	Mar 25, Apr 17	Geo R Spinney, 310 Pine
Brunswick Con G M Co, Cal	8	2c	Mar 20,	Apr 20, May 15	J Stadtfeld Jr, 309 Montgomery
Bullion Con G M Co, Cal	1	10c	Feb 19,	Mar 25, Apr 25	C A Grow, Mills Building
Cballenge Con, Nev	18	5c	Feb 19,	Mar 26, Apr 16	C I. McCoy, Mills Building
Con New York, Nev	13	5c	Feb 19,	Mar 26, Apr 17	Cbas E Elliott, 309 Montgomery
Crown Point G & S M Co, Nev	65	25c	Mar 12,	Apr 16, May 7	Jas. Newlands, Mills Building
Eureka Con, Nev	13	25c	Feb 19,	Mar 25, Apr 11	H P Busb, 134 Market
Granite G M Co, Cal	2	1¼c	Jan 2,	Mar 9, Apr 6	Wm Sebaw
Gray Eagle M Co, Cal	39	5c	Mar 2,	Apr 8, Apr 26	A P Swain 309 Montgomery
Inyo Marble Co, Cal	25	10c	Jan 21,	Mar 6, April 5	W W Sargeant, Mills Building
Iowa M Co, Nev	20	5c	Mar 6,	Apr 9, Apr 27	R L Thomas, 419 California
Julia Con M Co, Nev	26	5c	Feb 13,	Mar 20, Apr 10	J Stadtfeld, Jr., 309 Montgomery
Justice M Co, Nev	58	10c	Feb 9,	Mar 14, Apr 3	R E Kelly, 309 Montgomery
La Candelaria M Co, Mex	8	$2	Mar 7,	Apr 9, Apr 27	G A Hill, 22 Market
La Grange H M Co, Cal	10	25c	Feb 23,	Apr 1, Apr 22	A Halsey, 328 Montgomery
North San Juan G M Co	1	12c	Jan 28,	Mar 8, Mar 27	H W Morris. 143 First
Occidental Con M Co, Nev	18	10c	Mar 20,	Apr 23, May 15	A K Durbrow, 309 Montgomery
Osborn Hill G M Co, Cal	4	25c	Feb 27,	Apr 4, Apr 24	R R Grayson, 331 Pine
Reed M & M Co, Nev	1	2c	Dec 31,	Feb 11, April 3	John H Isbam, room 33, Mills Bldg.
Soutb Eureka M Co, Cal	17	1c	Feb 20,	Apr 1, Apr 22	A Haisey, 328 Montgomery
Starligbt Mining Co, Cal	5	10c	Feb 11,	Mar 18, Apr 8	H R Williar, 214 Pine

MEETINGS.

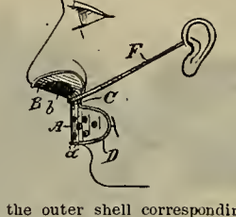
Company and Location.	Secretary and Office in S. F.	Date.
Champion M Co, Cal	J F Holling, 113 Crocker Building	April 9

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are wortby of special mention:

RESPIRATOR.—Robert Nagler, San Francisco, Cal. No. 535,718. Dated March 12, 1895.

The object of this invention is to provide a light, rigid device, properly shaped to fit over the mouth and nostrils of the wearer, with a means for detachably applying a suitable porous material through which respiration will take place, and fitted between an outer shell and an inner covering; perforations made



tbrough the outer shell corresponding with tbe apertures of tbe nostrils and the mouth; and an inner flexible lining, impervious to air, adapted to rest upon the edges of the nostrils and over the mouth, and perforated to correspond with the outer plate; together with an elastic or other attachment for holding the whole in place, so that air which enters the lungs may be purified from injurious particles which may be floating in the atmosphere, or so that it may be medicated for a treatment for lung and throat troubles.

CHIMNEY AND VENTILATOR CAP.—F. C. and H. A. Stober, Sacramento, Cal. No. 535,634. Dated March 12, 1895. The object of this invention is to provide an improved chimney and ventilator cap. It consists of a chimney or body portion converging from the upper end downwardly, pipes or tubes entering the same between the ends converging from their bases upwardly and outwardly, a cap of large diameter above the top of the cbimney or body portion, and arms depending from the cap, extending down along the exterior of the chimney or body with their lower ends formed into hooks adapted to receive rods or guides for anchoring the device in position.

MESSAGE AND CARD RECEIVER.—John T. Stone, Oakland, Cal. No. 535,635. Dated March 12, 1895. This invention is designed to provide a convenient device which will enable a visitor to leave a card or message for tbe person visited, and to transfer said card after writing upon it to a closed receptacle, leaving a blank card in its place for the next visitor. It consists of a case having an opening through which the cards are exposed, a movable spring-actuated follower, a slot or opening through which cards may be introduced when the follower is depressed, a second closed chamber in line adjoining the first, having a slot between the two corresponding with tbe position of the exposed card, and a mechanism wbereby the card may be advanced from the containing case through the slot into the second receptacle.

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A Book for Civil Engineers, Miners, Millmen, Hydraulicians, Mining Engineers and Irrigators.

BY P. M. RANDALL.

The following brief abstract of the contents will give an idea of the branches of the subject treated: General Plan; Discussion of the Principles of Hydraulics; Rules Deduced from Formulæ Obtained; Examples and Calculations; Extensive Tables for Ready Reference; Fundamental Laws of Hydraulics Demonstrated and Expressed in Formulæ and Rules; Flow of Water Through Openings; Weir Coefficients; Triangular Weirs; Flow of Water over Quadrant Weir (tabulated); Application of Tables; Submerged Orifices; Flow Through Orifices in Thin Partitions; Tables and Applications; Miners' Inches; Tables and Calculations; Flow of Water Through Short Tnbes and Compound Tubes; Flow of Water Through Pipes; Tables of Velocities and Cubic Feet Flows for Given Fall per Mile and Diameter of Pipe; Coefficient for Bend—Circular and Angular; Flow Through Nozzles; Inverted Siphons; Flow of Water in Open Channels, Extensive Tables; Rougb and Ready Notes; Hints for Speedy and Approximate Estimates, etc.

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Assessment Notices.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Grass Valley Mining District, Nevada County, California.

Notice is bereby given, that at a meeting of the Board of Directors held on the 20th day of March, 1895, an assessment (No. 8) of Two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, Nevada Block, San Francisco, California, or to the Treasurer, J. J. Halpin, 57 Broadway, room 57, New York City, State of New York, on or before the 20th day of April, 1895.

Any stock upon which this assessment shall remain unpaid in San Francisco, on the 20th day of April, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD JR., Secretary.

Office—Room 56, Nevada Block, San Francisco, California.

FAIRFAX VILLA COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 19th day of February, 1895, an assessment, No. 2, of one hundred dollars ($100) per sbare was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of March, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 16th day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office—Room No. 56, No 309 Montgomery street, San Francisco, California.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 20th day of March, 1895, an assessment (No. 18) of Ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 23d day of April, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

CHALLENGE CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the nineteenth (19th) day of February, 1895, an assessment (No. 18) of Five Cents (5c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 35, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-sixth (26th) day of March, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on TUESDAY, the sixteenth (16th) day of April, 1895, to pay the delinquent assessment, together with cost of advertising and expenses of sale.

By order of the Board of Directors.

C. L. McCOY, Secretary.

Office—Room 35, third floor, Mills Building, corner Bush and Montgomery streets, San Francisco, California.

BOOTH GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Auburn, Placer county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the eighteenth day of February, 1895, an assessment (No. 5) of Two (2c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, No. 310 Pine street, Room No. 28, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of March, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on WEDNESDAY, the seventeenth day of April, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. R. SPINNEY, Secretary.

Office—No. 310 Pine street, Room No. 28, San Francisco, California.

IOWA MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia City, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of March, 1895, an assessment, (No. 20) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 2, 419 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of April, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on SATURDAY, the 27th day of April, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. L. THOMAS, Secretary.

Office—Room 2, 419 California Street, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Geo. W. Edwards, in the Blacklock Mine, near Placerville, El Dorado Co., Cal., to impound tailings behind a brush dam in Spanish Ravine, from Kelly & Matheny, from Rattlesnake Bar, near Auburn, Placer Co., Cal., to deposit tailings on bank of American River; from O. M. Henry, in the Dry Gulch Mine, near Volcano, Amador Co., Cal., to deposit tailings behind a dam below the mine; from J. K. Williams, in the Saw Mill Flat Mine, near Whiskytown, Shasta Co., Cal., to deposit tailings in an old hydraulic pit; and from Thomas Ewing, in the Mooney Placer mine, near Placerville, El Dorado Co., Cal., to deposit tailings in old hydraulic pit, gives notice tbat a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on April 1st, 1895, at 1:30 P. M.

Coast Industrial Notes.

—British Columbia sawmill men are supplanting white labor with Japanese.

—Los Angeles reports that the new smelter will be in operation there by July 1st.

—Fourteen vessels have been chartered for the Alaska salmon business, to be ready after April 1st.

—N. E. Ayers & Co., of Portland, Or., have incorporated under the name of The Portland Rolling Mill.

—An order for 170,000 bricks has been placed for the construction of a smelting works at National City.

—Only 25% of the shingle mills on the Portland line of the Gray's Harbor country were running March 1st.

—The Oakland Gas Light and Heat Company are about to put in new machinery aggregating in cost $100,000.

The passenger receipts of the Seattle Consolidated Street Railway Company for 1894 show a decline of $21,823 as compared with 1893.

The Canadian Pacific railway earnings for the week ending March 7th were $264,000; for the same period last year, $308,000. This is a decrease of $44,000.

F. T. Sutherland, the manager of the Pacific coast agency for the Jones Rock Drill, is now located with the Parke & Lacy Co., 21 and 23 Fremont St., this city.

The Sailors' Union has declared a strike from San Diego to Puget Sound. For two years the rate of wages on the coast has been $25 a month, and now they demand $35.

Steamers to Humboldt bay ports have cut freights on lumber and shingles in retaliation upon the lumber schooners, which have been carrying passengers below the regular rates.

The Atlantic and Pacific is getting the cream of hauling the California fruit crop. Five and six through trains of oranges and dried fruit pass through Winslow, Arizona, daily.

The Merced Gold Mining Syndicate of California have ordered of the Gates Iron Works a 16x42 direct-acting hoisting engine with Corliss valves, steam brakes and the latest improvements.

—Commencing next Saturday the steamer Dora will connect with the Pacific coast steamers at Juneau, carrying the United States mail between that port and Sitka, Karluk, Sand Point and Onalaska.

—The Los Angeles Railway Company incorporated in this city last Tuesday, to construct and operate street railroads in Los Angeles. Directors—Lovel White, Thomas Brown, John D Bricknell, A. H. Payson, George Stone, Alfred Borel and M. H. Sherman. Capital stock, $4,000,000; $3500 has been subscribed.

—The Piedmont Consolidated Cable Company was sold under the hammer at Oakland last Tuesday to Charles R. Bishop, vice-president of the Bank of California, for $82,000, he being the only bidder. The bondholders of the company are frozen out and the stockholders may be held responsible for the million-dollar indebtedness.

—Liens aggregating over $100,000 have been filed in San Bernardino against the Nevada Southern railroad by mechanics and men, including one claim by the original contractor on the construction of the road. From the character of these claims they will take precedence of other indebtedness against the road and will be foreclosed at once and the road sold.

—The Moraga Valley Railroad Co. has incorporated to build a railroad in Contra Costa and Alameda counties, 35 miles from Walnut Creek to San Francisco bay. The directors are A. A. Grant, of Albuquerque, N. M.; J. T. Williams, of Oakland; J. R. Grant, of Los Angeles, and A. McDonnell and J. A. Burton, of this city. The capital stock is $500,000, of which A. Grant has subscribed for $22,500, J. R. Grant for $10,000, McDonnell and Burton for $1000 each, and Williams for $500.

DELINQUENT SALE NOTICE.

REED MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Ferguson Mining District, Helene, Lincoln county, Nevada.

NOTICE.—There are delinquent upon the following described stock, on account of assessment No. 1, levied on the 31st day of December, 1894, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amt.
J. H. Isham, Trustee	6	500	$10 00
J. H. Isham, Trustee	7	2,500	50 00
J. H. Isham, Trustee	8	50	1 00
J. H. Isham, Trustee	9	50	1 00
J. H. Isham, Trustee	14	33,400	668 00
J. H. Isham, Trustee	13	73,000	1,460 00
J. H Isham, Trustee	18	75,000	1,500 00
Geo. G. Reed	15	12,857	257 14
Geo. G. Reed	17	2,143	42 86

And in accordance with law, and an order of the Board of Directors, made on the 31st day of December, 1894, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the Company, Room 33, Tenth Floor, Mills Building, San Francisco, California, on WEDNESDAY, the third (3d) day of April, 1895, at the hour of 11 o'clock A. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of the sale. J. H. ISHAM, Secretary.

Office—Room 33, Tenth Floor, Mills Building, San Francisco, California.

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DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA. Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo County, California.

NOTICE.—There are delinquent upon the following described stock on account of Assessment No. 26, levied on the 21st day of January, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald	453	250	25 00
C. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	382	200	20 00
Alex. McLaughlin, Trustee	369	122	12 20
Alex. McLaughlin	414	200	20 00
W. D. Mansfield, Trustee	438	131	13 10
Geo. Dillman	420	980	98 00
E. J. Sanders	384	98	9 80
E. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
Louis Vesaria, Trustee	308	1,000	100 00
Louis Vesaria, Trustee	346	307	30 70
Israel Luce, Trustee	347	1,000	100 00
A. F. Thane, Trustee	447	500	50 00
Chas. E. Anderson	456	500	50 00
Chas. E. Anderson, Trustee	463	12,165	1,216 50
W. W. Sargeant, Trustee	182	1,250	125 00
W. W. Sargeant, Trustee	185	1,000	100 00
W. W. Sargeant, Trustee	188	745	74 50
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	514	500	50 00
W. W. Sargeant, Trustee	516	600	60 00
W. W. Sargeant, Trustee	518	1,000	100 00
Jos. Rosenthal	189	5	50
H. H. Noble, Trustee	523	4,000	100 00
H. H Noble	524	100	10 00
Mrs. Hattie C. Baggs	305	600	60 00
Mrs. Hattie C. Baggs	306	379	37 90
Mrs. Hattie C. Baggs, Trustee	317	301	30 10

And in accordance with law, and an order of the Board of Directors, made on the 21st day of January, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 13, Third Floor, Mills Building, San Francisco, California, on FRIDAY, the 5th day of April, 1895, at the hour of one o'clock P. M. of said day, to pay delinquent assessments thereon together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office—Room 13, Third Floor, Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

DUMBARTON LAND AND IMPROVEMENT COMPANY.—Location of principal place of business, San Francisco, California; location of works, in the counties of Alameda and Santa Clara, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 7) levied on the 22d day of January, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Name	No. Certificate.	No. Shares.	Amt.
Charles L. Benton	567	200	$25 00
Charles L. Benton	569	100	12 50
Mrs. Ellen Dwyer	124	100	12 50
Edward Fox	524	400	50 00
Mrs. Elma Glover	413	60	7 50
Jabez Howes, Trustee	450	1,200	150 00
Jabez Howes, Trustee	487	667	83 38
Jabez Howes, Trustee	494	500	62 50
Jabez Howes, Trustee	495	500	62 50
Jabez Howes, Trustee	512	50	6 25
Jabez Howes, Trustee	533	125	15 62
Jabez Howes, Trustee	580	175	21 88
Patrick Holland	137	50	6 25
D. E. Hayes	156	40	5 00
D. E. Hayes	199	1,000	125 00
D. B. Hinckley	497	1,000	125 00
A. Kappeumau	248	400	50 00
Mrs. Anuie A. Pritchard	120	50	6 25
Mrs. Annie A. Pritchard	422	100	12 50
H. W. Quitzow	129	100	12 50
H. W. Quitzow	130	100	12 50
H. W. Quitzow	131	100	12 50
H. W. Quitzow	132	25	3 12
H. W. Quitzow	133	25	3 13
H. W. Quitzow	134	25	3 12
H. W. Quitzow	135	50	6 25
Mrs. Catherine Rimington	216	20	2 50
James Spiers	498	1,000	125 00
Mrs. Faunie L. Waller	140	50	6 25
E. L. Wagner	227	1,000	125 00
L. P. F. Waller	525	220	27 50
L. P. F. Waller	530	100	12 50

And in accordance with law, and an order of the Board of Directors, made on the 22d day of January, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the Company, No. 214 Pine street, on THURSDAY, the 21st day of March, 1895, at the hour of 2 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

JABEZ HOWES, Secretary.

Office—214 Pine street, Room No. 5, San Francisco, California.

NOTICE OF POSTPONEMENT.

In accordance with an order of the Board of Directors of the Dumbarton Land and Improvement Company, adopted at a regular meeting, held on the 26th day of February, 1895, the day of sale for unpaid Assessment No. 7 is postponed to THURSDAY, March 28th, 1895, at 2 P. M.

JABEZ HOWES, Secretary.

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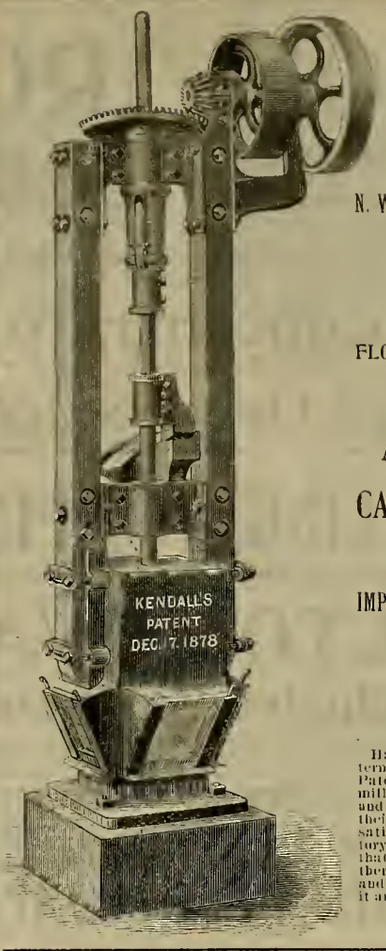

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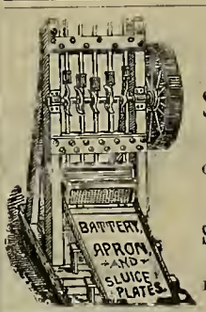

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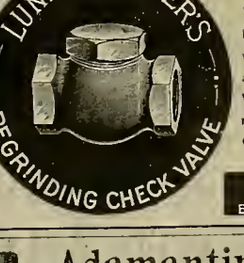

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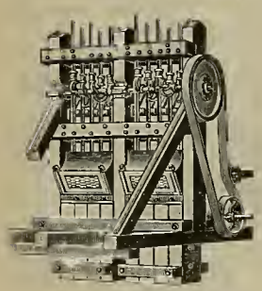

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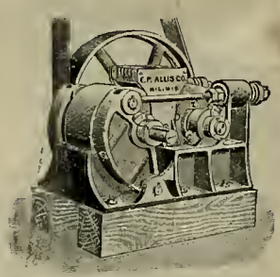

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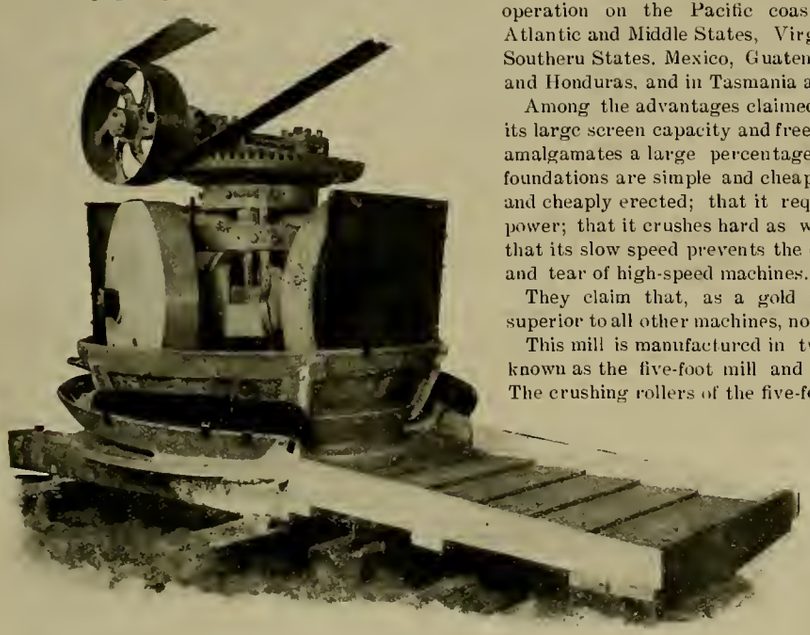
AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 13. SAN FRANCISCO, SATURDAY, MARCH 30, 1895. THREE DOLLARS PER ANNUM Single Copies, Ten Cents.

Improved Bryan Roller Quartz Mill.

On this page is presented an illustration of what



IMPROVED BRYAN ROLLER QUARTZ MILL.

is known as the Improved Bryan Roller Quartz Mill; directing the miners' attention to a machine that, in these days of new inventions, proves that the old principles of milling are hard to excel.

The old arrastra, which probably was used earlier than stamps, is still in use in its crude form, and, in some instances, is considered superior to new and improved machinery. The arrastra "did the work" and did it well, and so did the Chilean mill, which may be considered developed from the arrastra. But greater capacity was required, and as the stamp battery at that time was the only machine arranged for a continuous crushing process, it took the lead, as its capacity was so much greater.

As for amalgamation, the principle of the arrastra and Chilean mill is by some claimed to be superior. Many different kinds of roller mills were tried, but they were too complicated and difficult to keep in repair, and the oil could not be prevented from dropping into the pulp, which made the quicksilver unable to amalgamate with the gold. It was after many years of experimenting and with great expense that the manufacturers of this mill were able to place it on the market—a machine that embodied all the advantages of the crude arrastra and Chile mill, and, at the same time, possessed the simplicity and durability that were required in mining machinery.

At present about a hundred of these machines are in successful operation in this country, as well as in Mexico and other places. This mill has certainly passed the experimental stage, as the manufacturers inform us that they are in successful operation on the Pacific coast, as well as the Atlantic and Middle States, Virginia, Georgia and Southern States, Mexico, Guatemala, San Salvador and Honduras, and in Tasmania and in Australia.

Among the advantages claimed for this mill are its large screen capacity and free discharge; that it amalgamates a large percentage of gold; that its foundations are simple and cheap; that it is quickly and cheaply erected; that it requires a minimum of power; that it crushes hard as well as soft ore; and that its slow speed prevents the extraordinary wear and tear of high-speed machines.

They claim that, as a gold amalgamator, it is superior to all other machines, not excepting stamps.

This mill is manufactured in two sizes, of what is known as the five-foot mill and the four-foot mill. The crushing rollers of the five-foot mill are forty-four inches in diameter, with a seven-inch face, and weigh 3650 pounds each. The four-foot mill has smaller rollers, weighing 1200 pounds each, but is manufactured so that a weight drum can be used if necessary; and the claims of wear and tear, as set forth by the manufacturers, are that a set of wearing parts for a five-foot mill will crush from four to eight thousand tons of ore, and a set for a four-foot mill will crush from fifteen hundred to two thousand tons of ore.

The five-foot mill requires but six-horse power, and its capacity is from twenty-five to thirty-five tons per day of twenty-four hours.

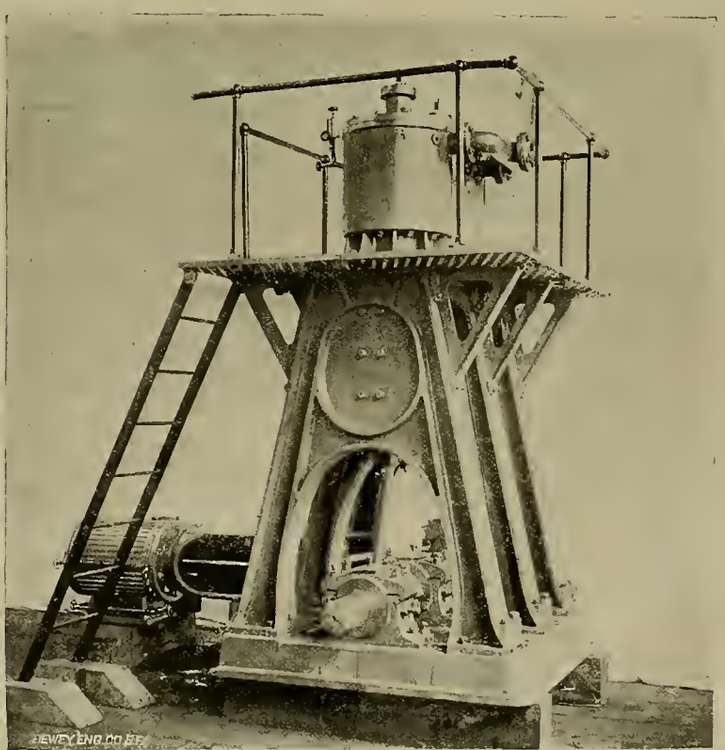
The four-foot mill requires five-horse power, and crushes from twelve to twenty tons. The four-foot size is also made in sections suitable for mule-back transportation.

The Risdou Iron and Locomotive Works, of this city, who are manufacturers of this type of mill, will take pleasure in giving further particulars, as they manufacture this mill in combination with plain gold mills, steam or water power; concentrating gold mills, steam or water power; and wet-crushing silver mills, steam or water power.

This mill is also well adapted for re-crushing jig tailings from coarse concentration works before concentrating on vanners.

Rix Air Compressors.

The accompanying cut shows a vertical air compressor, built by the Fulton Engineering and Ship-Building Works for the Whitlock mine, after the designs and patents of Edward A. Rix, of this city. It is rather an unusual thing to see a vertical single-acting compressor in these days, where a cheap machine seems to be the primary consideration in the purchaser's mind. This compressor cost just twice as much as the ordinary machine of the same capacity, and inasmuch as Mr. William Johns, manager of the Whitlock mine, is well known as one of the most economical mine operators on the coast, there must be some good reason for his investment; and it consists in this: In 1880 Mr. Rix built for the Sierra Buttes and for the Plumas-Eureka mines, under the management of Mr. Johns, two vertical compressors of this same type, the one at the Sierra Buttes operated continuously for eight years until the mine was closed and was then sold for 50% more than its first cost, while the one at the Plumas-Eureka has been continuously at work since 1880 and fifteen years of service has not altered its efficiency. The ordinary replacing of worn valves and springs is all these machines have cost for repairs. After such faithful service, Mr. Johns concluded he would have no other for the Whitlock. Looking at the compressor from a mechanical standpoint, it is quite remarkable that even after fifteen years this construction should still be the most economical single stage compressor built. The reasons are simple: It is vertical, and the cranks being at 180° the weights of the moving parts are completely balanced. The outlet valve, which covers the entire end of the cylinder, permits the piston to touch it at the end of each stroke and thus insures a complete displacement of the air. The engine, which lies at 90° from the compressor cylinder, is also connected at the same angle with the compressor cranks, thus being under full steam while the com-



RIX AIR COMPRESSOR, BUILT BY THE FULTON ENGINEERING AND SHIP-BUILDING WORKS.

(Continued on page 198.)

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Our latest forms go to press on Thursday evening.

J. F. HALLORAN.....General Manager

San Francisco, March 30, 1895.

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FROSTS in Solano county have destroyed the cherry crop: in Florida the orange crop. Droughts in Nebraska have destroyed the corn crop: in Georgia the cotton crop. In New York the louse has eaten the hop crop and in North Carolina something has happened the rice crop. The rural animal crop has also met with disaster. The gold crop seems the only one unaffected, and amid such wide devastation it is some comfort to know of one crop that is neither diminished nor destroyed.

PROBABLY no other manufacturing industry in the country is to-day so prosperous as that of bicycle making. It has been calculated that $250,000 a month is now being sent from this State eastward for the "silent steeds." This is a strong argument for the establishment of a bicycle factory here. Probably, "all things being equal," a Californian could be induced to buy a California-made bicycle were it shown to his satisfaction that it was at least as good as the Eastern-made article, were it furnished him at a little less than it costs him now after freight and three distinct profits are added to manufacturers' cost prices.

THE copper refinery in Anaconda, Montana, by the electrolytic process, has ceased to be an experiment. It is daily turning out fifty tons refined copper. In the acre of buildings are 600 vats. In these the copper anodes are placed, the crude copper precipitated therefrom, the electrolytic current transferring it to a thin sheet of copper, of which each anode furnishes two in about twenty days' time. It is the present intention to build a refinery at Great Falls three times the size of the Anaconda plant, the water of Black Eagle Falls to be utilized in furnishing the requisite electricity.

A CITY JOURNAL has started anew the controversy regarding hydraulic mining and, in well-meant effort to aid the miner, has elicited considerable bitterness from the valley press and incidentally has given the anti-debris association a chance to say over again much that it has been mouthing and mumbling for twenty years. It is believed the better way—the progressive way—is to conciliate, to reason together, to help the State rather than start snarling and snapping that can do no good and may do great harm. The miners have right on their side; they are securing public opinion also, slowly but surely, and the justice of what they ask is being generally conceded, even by many of their former opponents. To arouse antagonism and incite bitter rejoinder is never wise, and now particularly ill-timed.

THE railroad's attempted selection of mineral lands has brought a snow storm of protests from the miners, who justly view the attempted grab as a direct menace to their interests. The whole thing is characteristic: the attempt to include mineral lands, the "advertising" of applications in the obscurest manner at a time when deep Sierra snow made it a life and death matter for many a miner to attempt reaching the Redding land office, the evident valueless character (from an agricultural point of view) of much of the land sought to be absorbed; all are illustrative of the spirit that must be met by organized action on the part of the Califoruia Miners' Association. All that could be done has been done, but the fight is by no means over, and work and money are still needed in the effort to keep public and private mineral lands in this State free from any real or apparent railroad title.

AT the recent session of the Manufacturers' Association, discussing urgent present needs, Geo. W. Dickie, of the Union Iron Works, said:

I made some figures the other day for a San Francisco house of the cost of a special steamer for service on this coast. The cost was, say $80,000. I was then asked to give the monthly cost of running this vessel in this State. In this case the State, city and county taxes just equaled the captain's pay, and it further showed that if our clients should have their New York agent get a ship built there, register her in the New York custom house, the annual expenses saved in taxes would enable the owner to give the preference to an Eastern builder of $20,000. This is the legislative encouragement we get for home industry.

Just so, and only by united and persistent effort can such untoward conditions be changed. The Association has made permanent organizatiou, and by continuous demonstration that this is a case where personal interest and public good go together, the home manufactures in every department of industry will be benefited.

THE Superior Court of Nevada county made a decision last Tuesday that will probably stand until the defendants can get the case before an appellate court. It is the case of Hawke vs. Webber and Quigley. The decision, in effect, is that in Nevada county no one can prospect for mineral on "railroad land," or land listed to the railroad, but which is unpatented. In the case of the land at issue in the suit, the General Land Office has not determined its character, nor has a patent been issued. The decision denies the defendants the right to prospect upon such land. It has been supposed that until patent was issued to the railroad company for the lands it claims, or for any lands, a miner could show that it was mineral land, and protest against issuance of such patent. If he be denied the right to prospect, how can its character as mineral land be shown? This may be law according to Judge Caldwell, but it will not be accepted as final by the miners of Nevada county or the State.

THE report of the Broken Hill Proprietary Company, issued last month, is received. It is interesting to American readers; it is the report and statements of accounts of the largest profitable silver mine in existence; it is about as far removed from this coast as it can well be; the system of bookkeeping is a most elaborate detail of infinitesimal details; the profits are princely; the methods almost totally different from ours. The present report of this immense silver mine in New South Wales is for the six months ending Nov. 30, 1894. During the previous year there was produced 6,750,569 ounces of silver 999 fine. There were 4079 ounces of gold produced in the same period. The cost per ton of the bullion was $6.95 in our money; five years ago the corresponding cost was $10.79. The general manager estimates 1,000,000 tons of payable oxidized ore in sight, besides as much more concentrating ores and sulphides. During the year the cost per ton of production was reduced from £2 12s 6d per ton to £2 3s 7d. The net profit for the six months ending Nov. 30, '94, was £343,216 17s 8d. On that day the assets of the company were £982,987 11s.

ENGLISH purchasers of or bidders for California gold mines usually evince a preference for what they term "a going concern"—that is, a bullion-producing mine, though apart from untoward experience there is no reason for the preference. The purchasers of a "prospect" have generally come out as well as buyers of developed, ore-producing mines. The California interpretation of the word "prospect" is wider than that given it by insular residents. With us, "prospect" and "prospector" have wide latitude of meauing. A "prospect" is generally more than a dictionary definition of the word implies. It is a mining property of at least sufficient value to justify the expenditure of considerable time and money in exploiting, exploring, securing title and developing, usually to the extent of the owner's financial resources. A "prospector" is by nature a little disposed to be too sanguine, such disposition being toned down by experience, but is withal a practical, experienced man who is unlikely to spend any time or coin on a valueless piece of ground. He may want too much for his claim, but under the circumstances cannot misrepresent it in such a way that his misrepresentations cannot be found out. If a "going concern" is profitable, the question arises why is the owner willing to sell, and a mistake in buying "a going concern" is always more costly than error in the purchase of "a prospect." It seems that the attention of purchasers can justly be given "prospects" as well as "going concerns," though owners of the former often stand in their own light by the excessive statements made or the excessive prices demanded.

CONSIDERABLE Eastern and foreign money is now being invested in California gold mining properties. It would be better were our own people, State or coast residents, to develop these paying properties and retain the dividends to further develop our resources, employ labor and build up the commonwealth; but it is better even to have outside enterprise come here and carry off gold than to let it eternally lie dormant. It will at least add to the aggregate wealth of the world when taken out of the hills and coined. A great objection to foreign control of our mines is that about the first thing an English company deems it necessary to do is to cut down miners' wages. We are told that "California must settle down to the Eastern level." It is also argued that "the East" is settling down to the European level, and Europe is probably settling down to the Asiatic level. The Asiatics are supposed to have no further depths of wage depreciation to reach. It is not here proposed to thrash over old straw in discussing rates of wages or the rights or wrongs of "labor" or "capital;" but it is a manifest fact that depreciation in the price of any article always induces proportional decrease in the quality of the product purchased, in any case where such depreciation is possible.

THE latest exposure of fraud in the mining world is in the case of President Haup, of the "Montana Mining, Loan and Investment Company." The usual swindling scheme is shown in the evidence at the trial. The company was organized three years ago, with an alleged paid-up capital of $12,000,000; a dozen worthless claims were secured, stock issued and sold to innocent investors, the whole thing being a repetition of a practice so common as to rank with the gold brick swindle and other bunco games. It is here referred to, to emphasize an assertion so often made in these columns—the downright dishonesty of prominent men allowing the use of their names in setting up such swindles. The present Governor of Montana and other prominent and wealthy mining men were at first in the corporation. True, they promptly withdrew when they found the whole thing was a fraud, but the mischief was done. While no charge of fraud can be laid against them, they tacitly endorsed the scheme, and lent such assurances as induced victims to pay money in who would not have lost their coin had it not been for belief in the financial integrity of these men, and, naturally, in the worth of what they fathered. It is, of course, unnecessary to expect that men eager to invest in wild-cat schemes are to be specially protected, as a matter of sentiment, but, as a matter of business, it is the duty of prominent mining men to expose fraudulent "mining" schemes, instead of endorsing and supporting them. The plea that they didn't know the scheme was a fraud is a poor one. The slightest exertion of ordinary business care would enlighten them as to its true character, and the fact that they themselves lost no money shows their own absence of confidence in the concern. Nothing more injures reputable and worthy mining investments than this too common practice of prominent mining men prostituting their reputations by allowing their names to be used as bait by those who fish for gudgeons; and those who charge that there are solid considerations for the permitted use of such names often have very natural reason for such assumptions. This particular concern was more of a lottery than anything else, and had no connection in any way with mining.

Concentrates.

THE Hite mine, Hite's cave, Mariposa county, is now reported bonded.

THE $64,000 shortage in the Carson, Nev., mint seems to be a plain case of stealing.

J. H. WILSON, of Red Bluff, has bonded his Oro Plato, Arizona, mine to Jno. W. Gerritt for $50,000.

THE owners of the Alpha mine are about to build a concentrator on Four Mile creek, Three Forks, B. C.

THE Supreme Court of Germany has cancelled the patent of the MacArthur-Forrest process in that country.

THE Willoughby mine at Funter bay, Alaska, has been sold to California men who will build a mill this summer.

THE Anti-Debris Association now holds secret sessions, the members being bound not to divulge their deliberations.

THE Zeile mill, Amador Co., which has been shut down for repairs at the mill and mine, is ready to resume crushing.

THE Burnt River G. M. Co. has organized in Portland, Or., to work gold bearing bars on Burnt river, Eastern Oregon.

THE Oregon Gold Mining Co. is about to resume work on the Red Jacket mine, Cornucopia district, Eastern Oregon.

THE Nation nickle mine in Churchill Co., Nev., is being fitted up with new machinery. A smelter is to be built in May.

THE Ashland, Or., mine will not be sold for the present, in the hopes that it can be disposed of at private sale for a fair figure.

MONTANA papers think the Anaconda people are about to absorb the Parrott properties—Parrott, Moscow and Little Minah.

RIVERSIDE sends word that "the miner's vote of the county will be heavier in four years than the vote of the orange-growers."

THE Rapid *Journal* says it costs $70 a day to run the Holy Terror gold mine in the Black Hills, and that the daily output is nearly $2000.

IT is the firm of Peck Brothers that bought the tailings of the Holmes and Caadelaria mining companies. The centrifugal process will be used.

A STAMP MILL has been ordered, and work on the Rose Hill gold mine at Grass Valley will go on under the superintendency of Supt. J. M. Wishart.

ALBERT HEDGER, of this city, is putting in and will operate some hydraulic mining machinery for the Red River Mining Company, at Elk City, Idaho.

THE first shipment of bullion from the Pilot Bay smelter was made last Saturday, consisting of two carloads which goes to the refinery at Aurora.

THE Copper Queen Company near Globe, Arizona, propose putting in an electrical plant, which will involve the transmission of power nearly fifty miles.

THE Argonaut Mining Company, Amador Co., have commenced suit against the Kennedy Mining Co. for $325,000 damages for alleged trespassing upon their ground.

THE Virtue, Baker Co., Or., mine's second clean-up for March amounts to 420 ounces, or $7980, making a total of nearly $13,000 for twenty days' run with twenty stamps.

A COMPLETE electric plant is to be put in at the Alaska mine, Pike City, Sierra county, of sufficient power to run all the hoisting and pumping machinery, and to light the mine and works.

THE owners of the Gladstone mine are coming to Shasta county to reside. They are among the wealthiest people in Cleveland, Ohio. The property is now on a self-sustaining basis.

THE *Argus* reports that subscriptions to the amount of $700 have been received at Auburn, Placer Co., to swell the fund of the Miners' Association and to be used in securing required legislation.

THE Shasta *Courier* says that the new owners of the Iron Mountain mine will not be likely to build a railroad to Red Bluff, because when they complete their reduction plant they will not ship ore.

F. AND S. MCCLOSKY, brothers, employed by the Union Mining Company of Cripple Creek, Colorado, have been arrested, charged with having stolen $100,000 worth of ore from the company.

MESSRS. SILVERMAN, Warren, Coram and Palmer, of Butte, Montana, have bought the Poorman, Novelty and California claims, Rossland, B. C., for $20,000. They intend to organize a company and stock the properties.

A TUOLUMNE PAPER hears that an English company has been given a bond on the Rawhide, Alameda and App mines and all the stock of the Tuolumne County Water Company. The price agreed upon is said to be $2,000,000.

THE following are recent Idaho incorporations: Idaho Consolidated Gold Placer Mining Co., of Pierce City, Idaho, $125,000; Alta Gold Mining Co., Boise, Idaho, $1,500,000; Canyon Creek Canal and Irrigation Co., Idaho, $16,000.

MR. PEARCE of Colorado City, Col., who has been at work on the precipitant process of securing gold, under date of the 23d, writes that the Carbon Gold Precipitant Co. will put its workings into operation at San Diego this year.

THE War Eagle, B. C., Company, up to a month ago manifested its ore as containing 2 ounces gold, 3½ ounces of silver, and 5 per cent copper. The custom house declaration now reads 2.23 ounces gold, 4 ounces silver and 5 per cent copper.

W. A. CLARK, of Montana and Arizona, is reported to have bought the refinery, copper wire works and brass works of Wallace & Son at Ansonia, Conn., for $1,000,000, for use in the United Verde mines at Jerome, Arizona. The statement is premature.

THE Ætna Consolidated Quicksilver Mining Company of California will pay its third dividend of ten cents per share, or $10,000, on May 1st. The Morning Star Mining Company of California paid two dividends on the 10th, amounting to $7 per share, or $16,800.

THE Yreka *Journal* says miners in Siskiyou are excited over the prospect of mineral lands going to the railroad company. There are men in Siskiyou, as well as in Shasta and Trinity, who have taken thousands of dollars out of ground belonging to the Government and didn't think enough of Uncle Sam to get a title to the ground that gave them riches. They are in a sweat now.

EUGENE BRADEN, director of the United States assay office in Helena, is authority for the statement that "Government statistics, covering a period of 400 years, show that there is a difference of only 1.8% in the annual net value of the gold and silver produced in the world."

MR. HANCHETT, manager of the syndicate handling the Silver Peak gold mines, Candelaria, Nevada, has completed a contract for milling machinery and lumber, and will immediately build a stamp-mill. The syndicate is composed of George Crocker and other San Francisco capitalists.

AMONG other claims to distinction the Grass Valley *Union* points with pride to the allegation that it was the first newspaper in the State to purchase a typo-setting machine, and it does not view with alarm the further statement that it will be the first to publish a newspaper in a tent.

GLASS BROS., of the Katy mine, at Basin, Mont., have paid $10,000 on the attachment claims against the company and secured an extension on the remainder of the $73,000 claims. The $15,000 in payrolls was also paid off and all attachments released, and the mine will resume operations at once.

DONALD GRAHAM, of Canada, has sued A. O. Viertong and wife, of this city, for $10,000 and six months' interest thereon. He paid that amount last August for some quartz claims in Tuolumne county, and now charges that the claims were "salted." The case is before the U. S. Circuit Court.

THE gasoline schooner, Anita, with concentrates from the Ybarra Mining Co., of Lower Cal., arrived last Wednesday from Ensenada, and was subjected to search for a $12,000 gold bar recently stolen from the company. No trace was found, and it is presumed that the stolen gold is hidden at Ensenada.

VISITING EXPERTS advise the erection of a 40-stamp mill at the Old Glory, Arizona, mine. There are two Griffin crushers of a daily 35-ton capacity there now. The mine is a big reef of quartz carrying free gold and sulphurets. The ore is said to run $17 a ton. Geo. J. Hilzinger has charge of affairs.

COLORADO has paraphrased California's sentiments, and now says: "If the world can't do without gold it can't do without Colorado. But if the Governmeat can do without silver, so can Colorado." So say we all of us. But the world can't do without gold, and the Government can't do without silver.

D. FLETCHER, of Denver, says he can treat Cripple Creek ore at $1 per ton. He pulverizes the ore in water by a rotary muller, and at the point of impact mercury in solution between positive and the negative points of a battery, catches the gold in a trough of quicksilver, and both are drawn off into a retort.

THE mining bill before the late Arizona Legislature became a law and is in force. This means a ten-foot hole on every claim located, within ninety days from the date of location. The law is intended to stop promiscuous locating of an entire county, and so held indefinitely by relocation from one year's end to another.

K. QUINE, of Riddle, Douglass Co., Or., has sold his placer mine to H. Ball of Tacoma. The property consists of a gravel bar on Cow creek, where considerable gold has been washed out with rockers. Mr. Ball will put in a pumping plant to cost $3,500. Panners are said to have made $1 to $2 a day on the ground.

THE Napa Consolidated Quicksilver Mining Company has declared two dividends of ten cents each, amounting in all to $20,000, payable next Monday. On that day the Ætna Consolidated Quicksilver will pay its third dividend, amounting to $10,000. The Homestake of South Dakota paid its 200th dividend of twenty-five cents per share, amounting to $31,250, on the 25th.

A SCHEME for the federation of Canadian mining associations is being adopted by the Nova Scotia Mining Association, Quebec General Mining Association, the Ontario Mining Association and others. It is proposed to get the mining men of British Columbia to organize and join the confederation as well. The council intends organizing a mineral exhibit in Montreal next year.

THE relief committee in Butte, Montana, after the explosion, handled nearly $44,000 at an expense of only $200. After spending $17,000 for claims of various kinds since the catastrophe, they ask to be relieved, to have all their accounts and receipts investigated, and express their willingness to turn over the remaining $27,000 to a new committee that shall make a final disposition of the surplus.

IT is feared in Montana that two of the three mineral land commissioners for each district are to be appointed outside of the State, to go to politicians defeated at the late election. The law properly executed by a competent commission familiar with the country will meet every requirement, but if the commission is composed of irresponsible men, or men in possession of no practical knowledge of the country, it will prove a failure.

AMERICAN horses are allowed to bring freight into Canada without duty being charged on the horses, but they are not allowed to carry freight out unless duty has been paid on them. The odd spectacle was recently seen of a wagon load of ore going out from the War Eagle, B. C., mine which had two horses in the shafts and two led behind. The two led behind were citizens of the United States. Those doing the work were Canadians.

PLANS for the Denver mining exhibit are being elaborated. One of these is to sink a shaft and reproduce sections of the famous mines of the continent. The workings in every particular are to be shown. Work on the shaft will begin long enough beforehand to get the mine ready to operate at the time the exposition begins. Two companies have expressed their willingness to provide all necessary sinking and driving machinery free of all cost for the advertising they would get.

THE following mining companies have recently incorporated: The Oro Fino Consolidated Mill and Mining Company—Principal place of business, Oro Fino, Siskiyou county; capital stock, $30,000; with R. J. Murray of San Francisco, Pimbrook Murray of Oro Fino, Blix Smith and Fred T. Smith of Oakland, and James B. Giffen of Sacramento as directors. The Home Ticket Gold Mining and Water Company—Principal place of business, San Francisco; capital stock, $100,000; with E. Jungerman of Columbia, Tuolumne county, A. A. Hobe, A. C. Inhaus and H. P. Dunning of Oakland, and R. A. Coleman of San Francisco as directors. The Penchblow Consolidated Gold Mining Company—Principal place of business, San Francisco; capital stock, $1,000,000; with G. M. Spencer, G. Senn, G. Grant, F. Frankenthal and W. G. Langdon as directors.

THE prices (including postage) of the publications of the California State Mining Bureau, payable in advance, to parties living outside of this State have been fixed as follows: VIth Report (1886), $1; VIIth Report (1887), $1; VIIIth Report (1888), $1; IXth Report (1890), $1; Xth Report (1890), edition exhausted; XIth Report (1892), 50 cents; XIIth Report (1894), $1; Bulletins No. 2 (Mine Timbering), 50 cents; No. 3 (Gas and Petroleum), 50 cents; No. 4 (California Fossils), 25 cents; No. 5 (Cyanide Process), 50 cents.

J. R. DE LA MAR, of Idaho, Colorado and Nevada, is in the city, and says he is ready now to buy a California gold mine, if he "can find one big enough." He will have no difficulty in that direction if corresponding requirements are sufficiently large. Capt. De la Mar has made considerable money in Idaho mines, has invented a cyanide process of his own, claiming greater speed and economy than in existing processes, and is putting in considerable machinery in Fergusoa district, Nevada, and Gillett, Colorado. He has secured one patent and has another pending.

LAST Sunday's Salt Lake *Tribune* says: "The directors of the North Fork Placer Mining Company, whose works are in Siskiyou county, Cal., held a meeting yesterday morning and decided to send a force of men under Mr. H. V. Carter, the president of the company, to California at once, to commence work and finish opening the mine. This preliminary work will take but a few weeks, as the great flume is finished and the ditch two-thirds completed. All that is necessary now is to make the connections and turn on the water. Bedrock was reached last fall, and shipping of gold will commence at once."

NONE but white men are now employed at the Hidden Treasure gravel mine, Sunny South, Placer Co. There is now a large number of men on the payroll. The running expenses of the mine for '94 were over $120,000. It is one of the many dividend paying mines of the State, of which little is heard, but which affords steady employment to many and pays its owners. On the same list may be placed the Mayflower gravel mine, three miles north of Forest Hill, in the same county, which employs about 100 men, and pays out nearly $8000 per month, and the Morning Star gravel mine, near Iowa Hill, employing fifty men, which has worked over 1000 feet of the channel at a handsome profit.

THE United States Geological Survey, under the direction of H. W. Turner, has finished a fine map of a part of the gold belt of California, which is a part of a series of maps now being prepared and which are to form a geologic atlas of the United States. The maps completed constitute "Jackson Sheet," and embrace a portion of the Sierra Nevadas, chiefly in the counties of Amador and Calaveras. These maps show the inequalities of surface, distribution of water, and the cultivated lands. They give exact height above sea level, contours, railroads, roads, trails, bridges and county lines, and are as nearly accurate as science can make them. The series comprises four different sheets, each devoted to a different subject, and will be especially valuable to miners.

THE famous old Morris Ravine drift mine, four miles from Oroville, in Butte Co., has been sold to a company of English mining men who have incorporated in London under the name of the Golden Butterfly. It consists of 1200 acres patented land, and is about as large as any one mining claim in the United States under one patent. The sale was made through Col. Frank McLaughlin, who will represent the company's operations. Considerable money was spent on the claim by its Indiana owners and still more taken out. Since the death of its principal owners, it has lain idle. Active work will at once begin on the mine. S. P. Moody will be superintendent. The local paper says many miners will be employed.

THE Alice Gold and Silver Mining Company has issued its annual report for the year 1894, in pamphlet form. The report shows that the total net silver product for the year, at the old standard value of $1.29 per fine ounce, was $455,631.08, but the discount for the year, in view of the demonetization of silver, was $231,294.86, leaving the total net product for the year $224,336.22. It also appears from the report that 116 men were employed during the year, and that the total receipts exceeded the total disbursements by $473.21. The total value of bullion shipments for the year amounted to $455,631.08, and the average price for which the silver product was sold was 62.64 cents per ounce. Thirty stamps of the sixty-stamp mill were worked during the entire period, while ten additional stamps were operated during the month of December. The gold product for the year amounted to $20,561.70.

WM. S. SMITH, who is located at Texana Mine, Wanks river, Nicaragua, writes that he left New York last October with a three-stamp mill, arriving at the mine November 10th. He immediately commenced the erection of his mill and has run it several weeks, but so far the returns are nothing. He reports the property as only a prospect. He will run the mill for another month, and if the returns are no better, will pull up stakes and return to the United States. He advises everyone to stay away from Nicaragua, as wages are low, the natives doing all the work. They work twelve to fourteen hours per day for from $10 to $20 per month, boarding themselves. He was led to believe that the company had a very rich property with lots of ore to work, but the ground is spotted and the richness of the spots is not enough to pay for prospecting to find another. Letters to and from Nicaragua are very uncertain, as the authorities closely inspect mail matter.

Personal.

LOUIS JANIN is in Grass Valley.

SUPT. OF THE MINT DAGGETT has returned from Mexico.

NELSON BENNETT, of Tacoma, Wash., is visiting Salmon river, Siskiyou Co., mines.

GENERAL MANAGER LEGGETT of the Bodie Standard Con. has returned from the East.

GEO. HOUGH, an Eastern man, succeeds Mr. Nichol as superintendent of the Comstock Tunnel Co.

E. S. HOLDEN, of the Lick Observatory, has been made a Commander of the Ernestine house of Saxony.

Electric Power Transmission.

The MINING AND SCIENTIFIC PRESS is in receipt of so many further inquiries regarding the electric plant at the Standard Con. mine, Bodie, Cal., that the easiest way to answer is to give an illustrated synopsis of descriptions by Mr. T. H. Leggett, the superintendent, who has given a clear and succiuct account in a paper read before the American Institute of Mining Engineers, in an article in the 12th report of the State Mineralogist, in an article in the MINING AND SCIENTIFIC PRESS last December, and elsewhere.

Over two years ago it was decided by Mr. Leggett and the mine directors that some better and cheaper motive power could be secured than paying $2000 a month for wood to run a 20-stamp mill, crushing and amalgamating 50 tons of ore per day. Electricity generated by water power was found feasible, and Mr. W. F. C. Hasson advised the use of a single-phase synchronous system, which was adopted. Water power was between twelve and thirteen miles away in Green creek, on the north slope of Castle Peak in the Sierra Nevada mountains, carrying 400 inches during the dry season and nearly ten times that amount during the period of melting snow.

An old ditch was cleared out, rebuilt for a length of 4570 feet, and a site selected for a power-house 355 feet vertically below its lower end. The ditch was made larger than was necessary for power purposes alone, it being intended to supply other parties when an excess of water made it admissible.

Figs. 1 and 2 give the data with regard to the ditch and pipe; Figs. 3 and 4 show the connecting flume, pressure-tank and waste-weirs. The arrangement of the screen adopted, while it occasions a loss of head of a couple of feet, was deemed necessary where anchor and slush ice form during cold weather.

The pipe is of large diameter, in order to permit subsequent enlargement of the plant, and also to reduce loss of head by friction. It is fitted with three 2½-inch air valves, to prevent collapse in case of sudden rupture, and is anchored at proper intervals with straps of 1¼-inch round iron. The slip-joints extend to a coupling to the armature shaft of a 120 K.-W. A. C. generator. The accompanying illustrations show the generator and water wheels in operation, and the generator switch-board at the power-house. The two similar sockets on the motor switch-board. The small converter in the upper middle of the switch-board has a transforming ratio of 30 to 1. Its primary coil is attached to the main-current wires

Fig. 1.

STANDARD CONSOLIDATED MINING COMPANY
Water and Electric Power Plant,
at Green Creek,
Near Bodie, Mono County, California.
Scale: 1 Inch = 1800 Feet

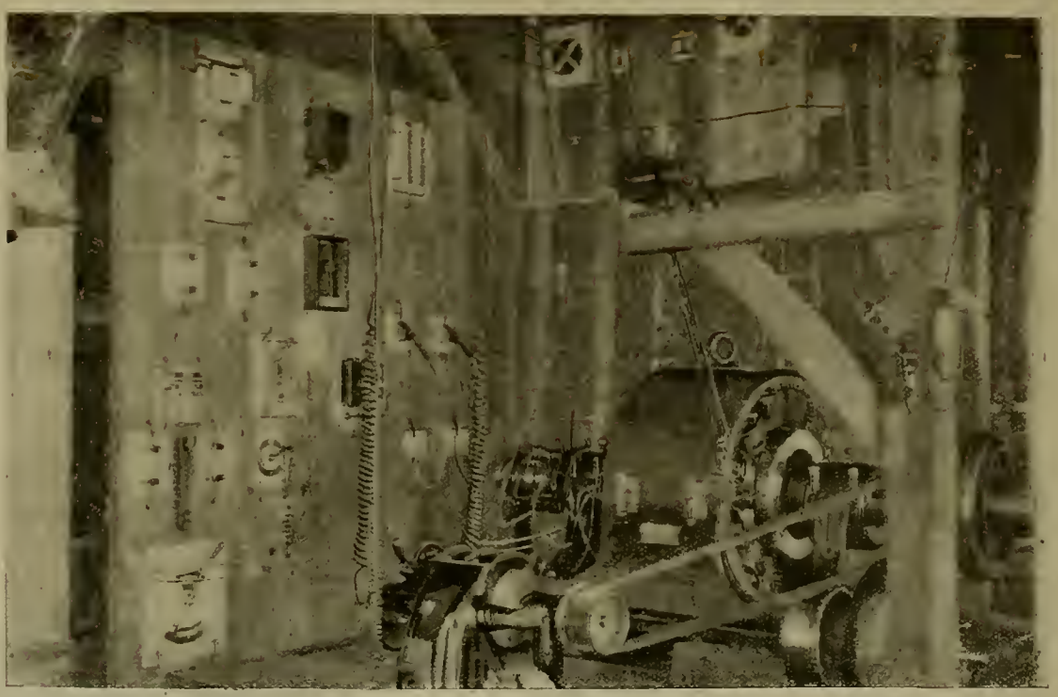
DATA:
DITCH 4560 ft. long, section, , grade, 0.2 ft. per 100 ft.; capacity 3,500 miners' inches.
PENSTOCK 12 ft. x 12 ft. x 6 ft.; capacity, 540 miners' inches (1.6 cubic ft. to the inch.)
PIPE LINE 1,571 ft. long,
1555½ ft. of 38 inch diam., No. 12 Iron C and S joints.
502¼ " " 30 " " 12 " " slip joints.
413 " " 22 " " 10 " "
RECEIVER Drum of John Steel, 9'6" x 20", with 18" Gate Valve, Safety Valve, etc.
EFFECTIVE HEAD 350 feet.
WATER WHEELS: 4 24-inch special Pelton Wheels, 240 H. P. Max., 865 Revs.
GOVERNOR One Doolittle Governor; one No. 2 Pelton Motor, 2,410 Revs.
DYNAMO: One No. 2, 120 K. W. Westinghouse A. C. Generator, coupled direct to wheel-shaft; E. M. F., 3,530 volts
EXCITER: One Type G Exciter with rheostat 2,050 Revs., driven by One No. 2 Pelton Motor, 910 Revs.
COST OF WATER POWER per H. P., $46.00.

Ditch
PENSTOCK
Ditch
Road
Creek
Green
Road
Road
Ditch
Road
Road
Road

see that all is running smoothly. Any change in tone of the hum of the dynamo warns him at once of a change of conditions, the tone rising or falling according as the speed increases or diminishes, though ever so slightly.

To insure the all-important factor of constant speed, a technometer, registering to 1200 revolutions, is belted to the water wheel and dynamo shaft. Its dial faces the water wheels, so that the attendant at the valve lever can readily maintain a uniform speed during the operation of "synchronizing" the motor and starting the mill, at which time the load is constantly varying.

In front of the jaw switch on the switch-board there will be noticed, in the view of the latter, a steel spring, and also two cords attached to the handle of the large rheostat. These cords are led around the side of the building to the attendant's place at the valve lever, as is also the one that releases the catch of the spring. A pull on these cords opens the exciter main-circuit instantly, and puts in the entire resistance box, thereby "killing" the fields of the generator and preventing any dangerous rise in electro-motive force, should the load be suddenly thrown off by a break in the wire-line, or other accident causing a sudden increase in the speed of the armature shaft. This arrangement was devised by Mr. Leggett, before the speed of the governor



GENERATOR SWITCH-BOARD AT POWER-HOUSE.

Generator in operation; exciter in foreground; choke coils and gap-lightning arresters on separate board.

POWER-HOUSE AT GREEN CREEK.

was trebled, the constant-resistance fly-wheel was put in and other changes were made, giving more sensitive and perfect control of the water power; and it is left in place because it might still be of use in case of emergency. The power-house is lit by a small 10 light converter attached to the generator-circuit, and when the generator is not in operation, by current from the exciter. Above is given an illustration of the power-house at Green creek.

The length of the line is 67,760 feet, or 12.46 miles. The poles are of round tamarack timber, 21 feet long, 6 inches in diameter at the top, set 4 feet in the ground; poles 25 feet long being used through the town, and along the line wherever there is danger of deep snow drifts. They are placed 100 feet apart, and fitted each with a 4 by 6-inch cross-arm, boxed into the pole, and held by one bolt and one lag-screw. The object of chamfering the ends of the cross-arms is to leave less room for the lodging of snow under the insulator.

The line crosses extremely rough country, not 500 yards of which is level beyond the town limits. Most of the ground is very rocky, over 500 pounds of dynamite being used in blasting the pole holes. Accompanying are views along the line in summer.

The wire is No. 1 gauge, soft-drawn bare copper, and is attached to standard, double-petticoat, deep-groove glass insulators. The distance between the wires is 3 feet 8 inches, and there are over 16.5 tons of copper in the line. The only objection found to the iron pins is their liability to be withdrawn from the cross-arm during a gale of wind, whenever there is an upward pull on the wire. To obviate this a number of pins were drilled with an ⅛-inch hole near the end, and in all such places these were used, and held firm by driving a wire nail through them.

The wire was first attached to the insulators by tie-wires of No. 10 galvanized iron wire. Later it was found advisable to insulate the line wire at the insulators, and for this purpose ordinary sheet rubber ⅛-inch thick, such as is used for gaskets, was cut into strips 1.5 inch wide and 12 inches long. These were wound spirally about the wire and held in place by two close wrappings of Manson's tape. The whole was then well daubed with asphalt paint, and the insulated wire re-attached to the insulators by tie wires of No. 6 weather-proof copper wire.

The line crosses a number of very steep ridges (from 300 to 800 feet in height), and on these the wire necessarily pulls heavily on the top pole, and especially on its pins and insulators. In all such places the ordinary double-petticoat insulators were replaced by the large Pomona insulator, on which the wire is carried in a groove across the top, and its weight is therefore directly down upon and in line with the center of the pin.

(To be Continued.)

SUMMER VIEW ON POLE-LINE, LOOKING EAST, TEN MILES FROM BODIE.

SUMMER VIEW ON POLE-LINE, LOOKING WEST, TEN MILES FROM BODIE.

THE Juneau *News* says the Berners' Bay mill is running twenty stamps by water and steam on high-grade gold ore from the Comet mine, which produces galena ore carrying gold.

Rix Air Compressors.

(Continued from page 193.)

pressor piston is under full pressure. It has a Meyers cut-off also to add to its economy. No beat from the engine is radiated to the air cylinder on account of its position.

This machine will pay for its increased cost in a short time in fuel saving, and will require little attention beyond that required for proper lubrication. The air flows to the cylinder through the piston, in which are four small valves, the springs for which can be renewed in not to exceed one minute when necessary.

The eugineering public is awaiting with considerable interest the completion of the 700-horse power compressors, for compressing air to the unusual pressure of 2000 pouuds per square inch, that Mr. Rix has designed, and which the Fulton Engineering and Ship-Building Works are now installing at Fort Winfield Scott, for operating the three pneumatic guns now being erected tbere.

Each compressor is triple stage, that is to say, the air is first compressed in two initial double-acting cylinders to about seventy-five pounds per square inch, then passed through a cooler composed of copper pipes, submerged in cold water, then taken into the intermediate single-acting ram and compressed to about 400 pounds to the square inch, thence through another cooler composed of smaller copper pipes, thence to the high-pressure ram, where it is compressed to 2000 pounds per square inch, and from thence through a final cooler of still smaller copper pipes to the storage reservoirs, which are a bank of steel tubes, twenty-four in number, thirty feet long, and having a diameter of sixteen inches and thickness of $\frac{13}{16}$ of an inch; the heads are welded in solid. It is very difficult to hold air at this pressure, and a small leak would soon materially detract from the capacity of the compressors. Special methods of making joints are employed, and all flanges, bolts, pipes, etc., are of a seemingly unnecessary proportiou. The engines to do this work are four in number, twenty inches diameter by twenty-four inches stroke, arranged with Meyers' cut-off. Tbere are four 72×16 boilers, arranged for forced draught, the air being forced into the furnaces by two steam Sturtevant fans, each having outlets twenty-two inches in diameter. The water for cooling the compressed air and for boiler purposes will have to be pumped from the old Spring Valley flume, about 2000 feet distant aud 300 feet below the level of the engine house. This will be doue either by electricity or compressed air, as may be deemed expedient.

Some careful experiments will be made with this plant to determine some questions hitherto unsettled and which will be of considerable advantage to engineers. Much tbought is now being given tocompressed air, as a means for power transmission, and eminent authorities are sanguine that it will shortly prove more efficient for general purposes than electricity or steam. The immense power plants in Paris and Birmingham show a marvelous efficiency and an ever-increasing demand from power users. Compressed air offers the very reasonable advantages that, the supply is boundless, it is perfectly elastic, easily transmitted, the exhaust from the motors is harmless, and it can be used for an endless variety of work.

Colorado Mining Stocks.

Writiug from Colorado Springs, Colorado, under date of March 25th, F. H. Pettingell, among other things, says :

This is a period when many anuual meetings of mining companies will be held. The owuers of stocks should carefully direct their interests and show some discretion in giving proxies, and it would be better by all means for them to attend these meetings if possible.

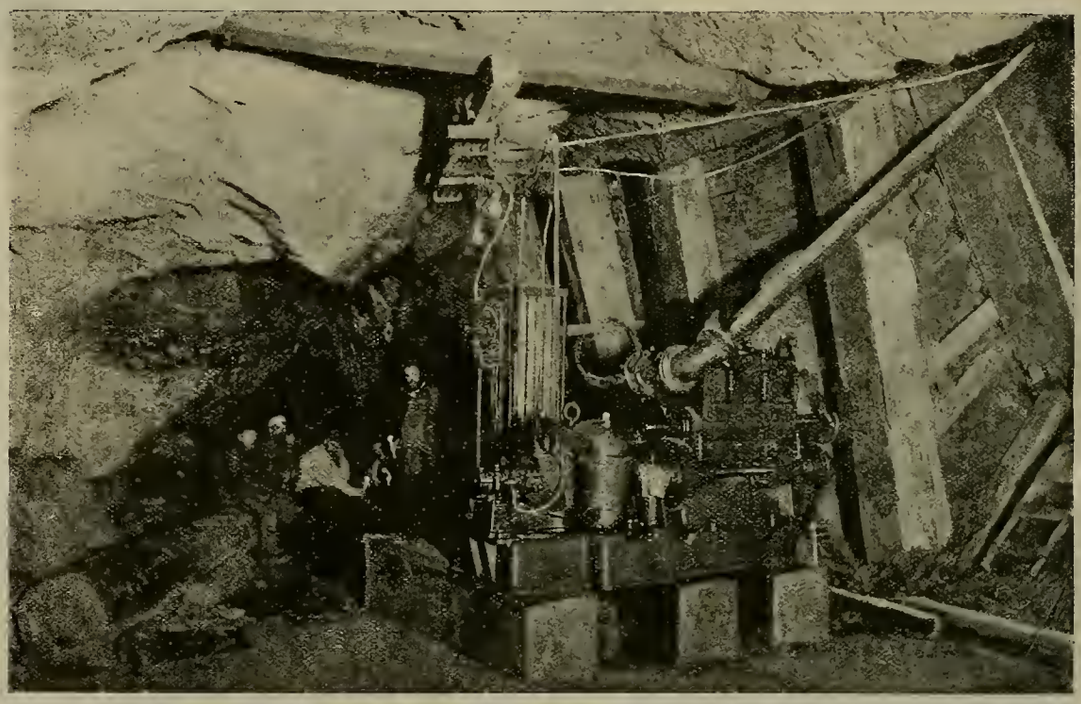
If the directory of the company has conducted the affairs of the company in a questiouable manner during the past twelve months, steps should be taken to accomplish a change. This can only be done by the uuited efforts on the part of the stockholders. Judging from the manner in which the affairs of certain companies have been conducted, any change would be a decided improvement.

There are too many stocks speculated in on this market, whose management is rotten to the core. If this is to go on uninterrupted, the probable result is too plain for comment. The business is, in my opinion, daily becoming more legitimized by many reforms, and these, of course, materially affect its permanency.

Electricity in the Gover Mine.

In several instances electric motors are in use underground in California mines. Herewith is illustrated an electric pumping plant on the fifth level of the Gover mine in Amador Co. Superintendent McCall says:

"Two triple-plunger Dow pumps are used—one with six-inch plungers raising $12\frac{1}{2}$ miuer's inches of water 341 feet vertically, and one with five-inch pluugers raising 11 miuer's inches of water 208 feet vertically. An Edison dynamo, No. 16, of 50-horse power capacity is used, and run at a speed of 820 revolutions per minute, tbe voltage being 220. Sprague motors are used. The one working the larger pump is run at a speed of 1000 revolutions per minute, giving 20-horse power; and tbe otber is run at a speed of 1250 revolutions per minute, producing 15-horse power. The voltage in the motors is the same as that of the dynamo. Copper wire $\frac{5}{16}$-inch in diameter transmits the power from the dynamo to tbe motors, a distance of about 1700 feet—1000 feet on the surface, and 700 feet down the shaft. The wires cause no trouble whatever in the shaft, retimberiug even being done without stopping tbe pumps. The shaft is quite wet in places. The pumps have run three years and four months, pumping during that time 50,000,000 gallons of water. The armature of the dynamo burnt out once, owing to injuries received in shipment, the core being sbifted. The commutator of tbe dynamo is turned down about once a year. The motors are connected with the pumps by gearing. Rawhide pinions are used on the armature shafts. The rawhide pinions last a year, and are more reliable and more satisfactory than those made of bronze. With the motors, the only precaution taken agaiust dampness is a thorough coat of paraffine paint. The smaller motor was run at one time for several hours with the field piece half way under water."



ELECTRIC PUMP ON FIFTH LEVEL, GOVER MINE, AMADOR COUNTY.

Obituary.

Captain D. l. Ezekiel, a widely known mining man of Denver, died in that city last Saturday.

William S. Pierce, manager and chief owner of the Petaluma Electric Light & Power Company, owner of the Pierce Telephone Company, president of the California Dairymen's Union, and one of the most wealthy and prominent citizens, was instantly killed by contact with one of the wires last Saturday.

John Timmons, one of the original builders of the South Yuba canal, and once a millionaire, died at the city almshouse last week. He was associated with the Comstock people twenty-five years ago, but lost his money in speculations. In the early fifties he was associated with J. S. Green, the Husseys and others in developing Nevada county's resources, building the Remington Hill ditch and the South Yuba canal. He sold his mines to Alvinza Hayward for a large sum, but sunk it elsewhere.

The annual report of the Bell Telephone Company shows the expenses of the company for the year to be $1,724,459.87, and tbe net earnings $3,123,789.05. Tbe surplus account December 31, 1894, showed $2,151,011.61. The long-distance company shows an increase in gross earnings of 13.4%, the amount for 1894 being $1,011,061.82.

A California Stamp Mill.

Many devices have been invented for crushing ore, but thus far the California stamp mill remains at the head of the procession. Tbese mills are built in batteries, usually of five stamps each, and ordinarily at first the mill consists of one battery only, but is so arranged that additional batteries may be placed in position when the mine is found to warrant the expenditure. The price of the mill is usually estimated at so much per stamp, usually costing about $1000 per stamp by the time the mill is ready to begin crushing ore. Of course, the price depends upon the difficulty attendant in getting the mill to the mine and also on the weight of the stamps, which runs from 250 to 950 pounds each. A medium-weight stamp, about 750 pounds, is most commonly used and is suitable for crushing almost any class of ore. Tbis estimate of so much per stamp includes the boilers aud engines, amalgamating plates and all that is necessary to haudle free-milling ore.

Each battery consists of a large integral cast-iron mortar having a rectangular bed, within which the "dies" are arranged. Each die consists of a square base having upon its top a cylindrical projection which is just tbe diameter of the stamp and is arranged to receive the blow from its respective staup. A layer of sand or ore is placed in the bottom of the mortar before the dies are placed in position, in order to form a cushion to prevent the blows from the stamp breaking the mortar. The mortar is cast with a heavy frame above it, somewhat like a basket with an exceedingly heavy handle, and in this frame are provided guideways in which play tbe stems of the stamps. Still above this frame is another heavy wooden frame, iu which play the upper ends of the stamp stems. Between the two frames is arranged the cam shaft, which is provided with one cam for each stamp. These cams are shaped somewhat like a very heavy, strong sickle, and are from eight to fourteeu inches in length. The handle end is provided with an opening, through which tbe cam shaft passes and a key secures it rigidly in place.

The stamp stems are round shafts of iron, and in a battery of 750-pound stamps the stems are about four inches in diameter. To the lower end of the stem is keyed a cast base, having a socket in which fits the stem of the stamp "shoe," which is from six to teu inches in diameter and about one foot in length when new. This shoe is also keyed in the socket so it can be easily removed when necessary. Upon each stamp stem, above the cam shaft and in the path of its respective cam, is keyed a collar called a "tappet," and at each revolution of the cam shaft each cam engages with its respective tappet and lifts the stamp until the cam passes from under the tappet and lets the stamp drop. The cams are arranged spirally around the shaft so that the stamps are raised aud dropped iu regular succession, and not all at once.

The rear of the mortar is closed by a thick, wooden plank which is wedged tightly in grooves in the mortar, while the front is closed by means of a screen of wire cloth or of slotted sheet metal. These screens are of different degrees of fineness, running from 40 to 120 openings to the inch, and the fineness of the screen depends upon the character of

the ore. When the gold is coarse a forty-mesh screen will answer, but if the gold is fine a sixty or eighty-mesh screen will be required. Very fine gold may require a 120-mesh screen, but this is unusual. The screens are fastened on frames which fit into grooves in the mortar-box, and are wedged firmly in place by iron wedges. Strips of blanket are tacked along the edges of the frame so that when in place the joints will be water tight, and all the matter which escapes from the mortar-box will have to pass through the screen.

The "drop" of the stamps that is, the distance they fall—is regulated by adjusting the tappets on the stamp stems. A seven and one-half inch drop is enough to crush ordinary quartz, but the hard quartz sometimes takes a drop of nine inches or more. Each stamp is arranged to drop from forty to ninety times per minute, dependent upon the distance it falls. If the drop is nine inches and the speed ninety times per minute, the cam will usually catch the tappet before the shoe hits the die, and of course the ore will not be crushed if this is done, the cam receiving the full force of the blow.

The ore is placed in a large hopper, which has its lower end closed by one side of a large, horizontally arranged iron plate, which is connected by means of cog-wheels; a ratchet and an arm, with a plunger which extends upward far enough to be struck by a tappet on one of the central stamp stems. This plunger can be regulated so that the tappet will only strike it when the stamp has just sufficient ore beneath it to keep it from "pounding iron," as it is termed when the shoe hits upon the die itself. When the tappet hits the plunger the plate is rotated an inch or two and the ore is carried against a scraper, which causes it to fall from the plate into the mortar-box; when too much ore gets beneath the stamp, the tappet does not strike the plunger and no more ore is fed to the stamps until enough has been crushed and washed from the mortar to allow the tappet to again strike the plunger.

In front of the mortar is arranged the "apron," an amalgamating plate, upon which is discharged all the crushed ore which passes through the screen. Amalgamating plates are also arranged in the "battery," as the inside of the mortar box is termed. These amalgamating plates are of copper, about three-sixteenths of an inch thick, and are plated with silver. Before being placed in position each plate is "charged" by being coated with quicksilver, which clings to the plate in a thin sheet.

Below the "apron" is arranged a long sluice, which sometimes has its bottom covered with amalgamating plates over which the ore all passes on its way to the "slum" pond. If the ore is hard to work, it is common to run it through "mullers," or larger cast-iron basins, each having a rotary grinder arranged therein.

When everything is ready the mill is started. The stamps are all "hung up," or, in other words, the tappets are held out of reach of the revolving cams by means of pivoted uprights which are arranged to sit beneath the tappets. In starting the mill the engine is set going and the cam shaft revolves, but as long as the tappets are supported by the pivoted uprights the cams revolve freely. To set the stamps in motion the millman takes a well greased wedge, which is covered on both sides with leather, inserts it beneath the tappet of the first stamp, and as the cam comes around it strikes the wedge and lifts the tappet from the upright, which is then swung to the rear out of the way, and the stamp is permitted to drop. The stamps are all released in turn, and in a few seconds the mill is in operation, and a deafening roar fills the building and reverberates from the hills. A stream of water is kept constantly flowing into the battery, and as the stamps pound the ore to powder it mixes with the water, and that ore which is fine enough passes with the water through the screen and down the sluice to the "tailing" or "slum" pond. Nearly all the free gold is amalgamated by the quicksilver on the plates in the battery, but what little is not catched on the "apron" plate, and, if the ore is rich, soon small, hard, white lumps begin to appear on the apron. When this occurs the millman knows that the quicksilver on the plates in the battery has taken up all the gold it will hold, and he begins to "feed the battery" by throwing in a small quantity of quicksilver to amalgamate the gold in the battery. The amalgam gathers on the battery plates, and as soon as hard amalgam begins to show on the apron more "quick," as it is called by the millmen, is fed to the battery.

If too much "quick" is fed to the battery, it splashes out through the screen and softens the amalgam on the apron until it runs freely; and when this occurs, no more "quick" is fed to the battery until the amalgam on the apron again gets firm.

The richness of the ore can be pretty accurately gauged by the amount of "quick" it calls for. In ordinary free-milling ore two ounces of "quick" will amalgamate one ounce of gold. The "quick" is fed by means of a small spoon, which holds about as much as a child's thimble, or one ounce of "quick."

Each stamp should crush one ton of ore in ten hours. If the battery takes ten ounces of "quick" an hour, the millman knows that the ore crushed during that time contained about five ounces of gold, worth usually about $17 per ounce; thus the ore would mill about $170 per ton.

All gold bullion is not of the same fineness. That is to say, as the gold comes from the ore it is mixed with baser metals, such as silver and copper, and the value of the gold bullion depends upon the amount of base metal it contains. Copper and silver will amalgamate as well as gold, so it sometimes happens that the battery takes lots of "quick," but the amalgam will be of slight value. It is impossible to give correct figures on the value of the ore until the bullion is assayed to determine the purity of the gold.

As each cam lifts its stamp, it partially rotates it by its action against the tappet, so that the stamp-shoes are constantly turning around and caused to wear evenly. As the shoes and dies wear away from the constant abrasion of the hard quartz, the stamps are lowered by raising the tappets upon the stamp stems. A stamp shoe a foot long, when new, will, in a month or two, wear down to one-half that length.

If no accidents occur, the mill is kept in operation until it is decided to make a "clean-up" of the amalgam. When this is decided upon, the stamps are "hung up" by a reversal of the operation by which they were set into action.

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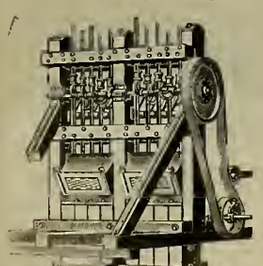

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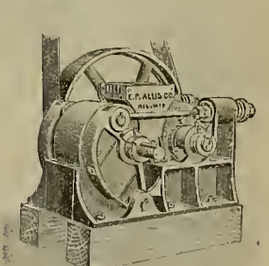

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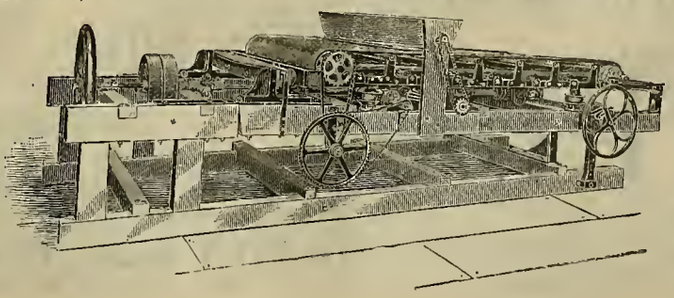

FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1895.
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You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. E. BALLOU, Propr. Ballou Reduction Works.

Scientific Progress.

A Tubular Frame House.

M. Caron, of Chamouuix, has just built a most peculiar house, for which he claims, first, a constant temperature and incideutally strength, durahility, comfort and beauty. The change of temperature in the valleys of this mountainous region is frequent and sevcre, and the buildiug of such a house was prompted by the severity and instahility of the climate. Mr. Caron first put up a frame of steel water tubing, allowing continuous circulatiou to a stream of water. Around this frame he put up his house in the ordinary way, the entire structure being a very pretty specimeu of the early Italian renaissance. The peculiarity is that all floors and ceilings are likewise crossed and recrossed by the water pipes. The water, after passing through the horizontal tuhes first, that is uuder the floors and ceilings, passes through the vertical tuhes until all have been goue through. In summer, spring water, fresh as is only the water of thc snow-capped Alps, circulates under pressure through the network of tubes, cools off thc walls, and, after having run its coursc, flows off considerahly warmer than when it entered. But in its course it has absorbed much heat, which it carries away. During the long and severe winter thc water, eutering through the basement, is first heated to nearly 100°, and then forced through the tubing. Of course, much of the heat is left all over the house, and at the outlet the temperature of the water is about 40°. The speed of the circulatiou of water can be regulated so as to allow the fixing of a certain temperature for the house, which is equal throughout. The house has been put to a practical test through the last eight months, aud has stood the trial well. The builder claims for it cheapness, solidity and elasticity, giving it immunity against earthquakes. The housc measures about 6000 cubic yards and weighs 120 tons, or 36 pounds per cuhic yard iuclosed. It is fireproof, having running water iu every room, and fire can he drowned out in a remarkahly short time.—La Nature.

Parts That Do Not Grow Old.

In his work on the senilc heart Dr. Balfour tells us that there are two parts of the human organism which, if wisely used, "largely escape senile failure." These two are the braiu and the heart. Persons who think have often wondered why brain workers, great statesmen, and others, should continue to work with almost unimpaired mental activity and energy up to a period when most of the organs and functions of the body are in a condition of advanced senile decay. There is a physiological reasou for this, and Dr. Balfour tells us what it is. The normal hrain, he affirms, "remains vigorous to the last," and that "because its nutrition is specially provided for." Ahout middle life, or a little later, the general arteries of the body begin to lose their elasticity and to slowly but surely dilate. They become, therefore, much less efficient carriers of the nutrient hlood to the capillary areas. But this is not the case with the internal carotids, which supply the capillary areas of the brain. On the contrary, those large vessels "continue to retain their pristine elasticity, so that the blood pressure remains normally higher than within the capillary area of any other orgau in the body. The cerehral blood paths being thus kept open, the brain tissue is kept better nourished than the other tissues of the body." Who is there amoug those who have reachcd or passed middle age that will not he rejoiced to find such admirahle physiological warrant for the helief that the brain may continue to work, aud even to improve, almost to the very last hour of life?

As soon as Thomas A. Edison can find the time, he means to learn something about argon, the newly discovered gaseous constitute of the atmosphere. Mr. Edison not only helieves in the discovery of Lord Raleigh and his co-workers, but thinks it probahle that further experiments will disclose other uew elements in the air. "To tell the truth," said the electric wizard, "the discovery of argon is a fresh evidence of how little we know even of the commonest matters. The air has heen analyzed over and over again for half a century without suspecting that it held any new elements." Mr. Edison explained that his investigations concerning his incaudescent lamp showed him phenomena which could only he explained on the hypothesis of a new element. But he was unable to say whether argon was responsihle for those phenomena.

Animals are like the bright and fragrant flowers of plants—when their function is accomplished, they wither and perish. The husiness of the auimal seems to be, not to live its own life, but to reproduce its own kind, and the term of life at its disposal is adjusted accurately to the special difficulties of this purpose. Death comes as soon as possible after the due number of successors has been produced, in order that each species may always he represented by a full tale of young and vigorous individuals. Natural selection acts like a contractor who has undertaken to keep a window box gay with fresh blossoms—each plant must he removed almost before its flowers fade.

The signal service of the Uuited States is founded on the text in Ecclesiastics: "All the rivers run into the sea, and yet the sea is not full." Commodore Maury writes that it was hy thinking on the meaning of this assertion that he first got at the central idea of what is now the growing science of meteorology.

Prof. Gilbert, the geologist, has come to the conclusion that the huge hole in the ground known as the Diablo cauyon, in Arizona, marks the place where a large meteor once struck the around.

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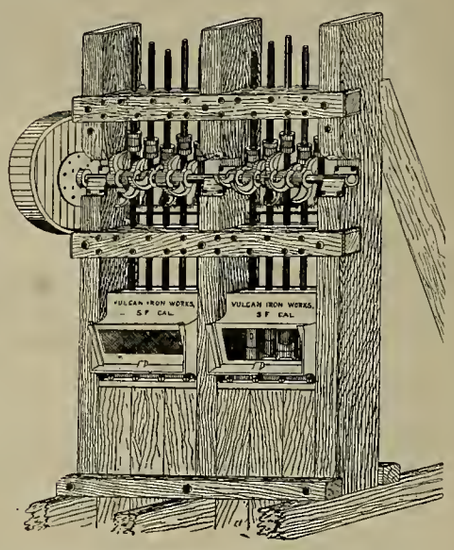

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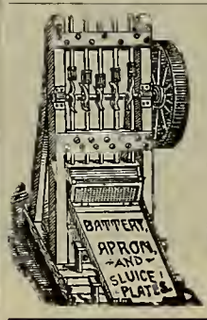

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Mechanical Progress.

The Wage Worker in Germany.

Vice-commercial Agent George H. Murphy, writing from Luxemburg to the State Department, gives some facts germane to present economic discussion. He finds that the standard of wages is almost the same in Luxemburg as in Germany. Generally speaking, the average earnings of ordinary workmen amount to less than $200 per annum. Women earn about half as much as men. The average wages of miners and foundry hands is less than $1 a day. The average annual salaries of primary-school teachers are $224 for males and $179 for females. A very large majority of the officials and employes of the Government earn less than $400 per annum.

On the other hand, speaking generally, the necessaries of life cost as much in central Europe as they do in the United States. A workman's expenditures for clothing and rent may possibly be somewhat less there than in the United States, but in the town of Luxemburg coal costs $7 per ton, eggs twenty-one cents per dozen, rye flour three cents per pound, wheat flour five cents per pound, sugar eight cents per pound, butter twenty-five cents per pound, beef nineteen cents per pound, veal and mutton sixteen to twenty cents per pound, fresh pork twenty cents per pound, and smoked pork twenty-three cents per pound.

WOOD-PULP PIPES, now coming into vogue for special uses, are manufactured by a very simple process. The pulp, says the *Scientific American*, is agitated with water and rolled upon a tube, and, after being thus wouud to a sufficient thickness around the tube, and the extra amount of water drained away, it is placed on end and the interior mold is withdrawn, leaving the wood-pulp tube, which is held on suitable supports and dried until the water is evaporated. The further process consists in dipping it into a very hot solution of asphaltum and other materials, which penetrate the whole substance; the ends are then squared up and the threads cut, or taper finish is made in the usual manner of wrought-iron pipe. This material, when finished, possesses high electrical resistance, rendering it suitable for underground conduits for electrical wires, and, as a non-conductor, it is free from being impaired by electrolytic action from earth return currents, which have become such a serious factor in impairing the water and gas pipes in cities where the street tram cars are propelled by electric motors using earth return currents; its resistance to acids and alkalies fits it for use in chemical works, and as a non-absorbent of water it is free from any difficulties due to expansion and contraction. The bursting strength of the tube is said to be from 150 to 250 pounds per square inch, according to the size.

IN speaking of the tendency of boiler-plates to crack, *The Locomotive* states that cracks frequently start from the edge of the plate opposite a rivet hole, in the girth joint that comes over the fire. Such cracks are often due to distress at the joint arising from an improper arrangement of the feed-pipe, for if the comparatively cold feed-water is discharged on or near the fire-sheet it chills the shell in that vicinity, and produces a powerful local contraction of the metal, which is quite sufficient to start the joints, or, under some circumstances, to even crack the solid plate. But whatever the cause of the cracks, they are likely to first appear at the edge of one of the fire-sheets and to extend gradually inward. Often they are stopped by running into the rivet hole and do not extend farther. Frequently, however, they run past the rivet hole or cross it and extend into the sheet on the farther side of it. It then becomes very important to check their further progress. This may often be done by drilling a small hole through the sheet at the very extremity of the crack. This hole may afterward be filled with a rivet, or it may be tapped and filled with a screw plug.

To Clean Machinery.

A method of removing sticky deposits of grease and dirt from parts of machinery by means of soda lye is quite extensively employed in England. To 1000 parts by weight of water are taken about 10 or 15 parts caustic soda and 100 parts ordinary soda. This mixture is boiled and the parts of the machinery to be cleaned are placed in it, when all grease, oil and dirt are quickly loosened. It is then necessary to wash the metal and dry it well. The actiou of the lye is to form with the grease soaps soluble in water. To prevent the lubricating oil, etc., hardening upon the parts of the machinery when in use, it is necessary to add a third part of kerosene, and it is well, also, to oil with kerosene from time to time.

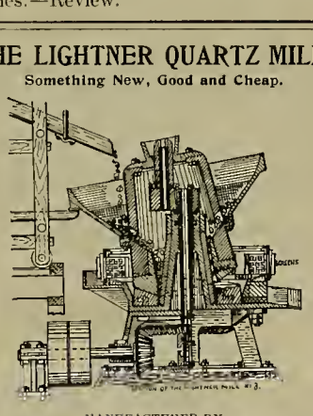
Surpassing Edison and Tesla.

W. W. Felts of 2228 O street, Sacramento, has a proposition iu eleetric lighting that is comprehensive. He elaims to have succeeded in developing a continuous electric light from a primary battery and that his battery is a perfect electrolite aud polarizer combined. He invites persons interested to inspect his thirty-two candle power incandescent lights at his residenee. But he refuses to allow anybody to inspect his battery, which is in a sealed box.

Electricity is Dutiable.

Comptroller of Canadian Customs Wallace has decided that electricity comes under the head of unenumerated articles, and consequently bears a duty of twenty per cent. The question arose over a proposition to transmit power from the American side of Niagara falls to surrounding Canadian cities.—Review.

THE LIGHTNER QUARTZ MILL.
Something New, Good and Cheap.



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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUSPENDED.—*Republican:* The gravel claim at Pine Grove, commonly known as the Wheeler mine, has suspended. They finished the first clean-up, which it is reported was sufficient to pay the expenses involved in putting the property on a good working basis, also the running expenses. Another payment on the bond became due this month, and they concluded to quit. Tbey paid $500 on the bond at the outset, so that sum represents their loss. The property was worked in a crude fashion, and it is thought that if it paid expenses under such conditions, there is little above that with proper management it would pay a handsome profit.

SOLD TO CHICAGO MEN.—The Bell Wether claim, a continuation of the Zcila ledge, has been sold to Messrs. Underwood and Snediker, of Chicago.

THE ANITA MINE.—A new Dow pump has been put in, which controls the flow of water. The miners bave all returned to work—three shifts of eight hours each.

Butte.

MAGALIA.—*Mercury:* The most active work at present being done is at the Lucky John mine by Gorrel & Ballard of San Francisco. Tbis is the mine that was owned hy J. D. Williams and N. A. Harris. Tbey are running for the channel hy tunnel, and are now in 1200 feet, and gravel bas been struck. From fifteeu to twenty men are employed.

At the Aurora an incline is heing put down which has reached a depth of 160 feet, and it is estimated tbat it will have to be put down nearly as much farther before the channel is reached.

At the Pershbaker an immense power plant is being put in sufficiently large to handle the water, together with air compressors. Parry & Merry, who have been working for six or seven years on a searcb for tbe main channel wbich underlies that country for a distance of thirty miles or more, are now to a depth of 700 feet, and they believe that success is abont to crown their efforts.

Calaveras.

THE BACHMAN MINE. — The old Bachman mine at Fourth Crossing, idle for fifteen years, bas been bonded by Ford Bros., who will put on a force of men developing.

THE IDEA REVERSED. — *Citizen:* Recent transactions at Murphys go to show that instead of the mine holder wanting a thousand dollars for a hundred dollar mine, it is capital tbat wants a thousand dollar mine for one hundred dollars.

TO BE EXTENDED.—Louis Fahl has taken a contract from the Buckhorn Mining Company, of Napa, Cal., to extend the tunnel in the Buckhorn mine.

BOUGHT A HALF INTEREST.—C. A. and E. C. Rudorff have bought a half interest in the Old Stiff gravel claim on Balaklava Hill, uear Vallicita.

El Dorado.

QUARTZ CLAIM LOCATED.—*Democrat:* Ed Stafford and Jas. H. Blakeley have located a quartz claim near Grizzly Flat. Fifty tons of ore from this claim have been worked in a stamp mill and paid $4 per ton in free gold.

Inyo.

ASSESSMENT—WORK RESUMED.—An assessment of ten cents per share bas been levied hy the Owens River and Big Pine Canal Company, delinquent April 6th.

Work has been resumed on several mining claims at Cerro Gordo.

Mariposa.

THE HEATON MINE.—There are now fourteen men employed at the Heaton mine.

Nevada.

THE BULLION AND IONE.—Tbe Bullion and Ione mines are to be worked again. Mr. Geo. Mainhart will be the superintendent.

THE SPANISH MINE.—Thirty men are now employed at the Spanish mine. Tbe new ten-stamp mill is crushing ore from the shaft. No stoping is yet being done. Mr. A. L. Begbie is superintendeut.

WORKING PLACER GROUND.—*Tidings:* M. Bates and E. Eagye are erecting a derrick and making other preparations for working that portion of Gold Run creek from Byrne's planing mill to Deer creek.

BELLE OF FRANCE.—*Tidings:* The lower tunnel at this mine has been reopened and retimbered for a distance of 360 feet. It was expensive and dangerous work. The ore chute was struck a distance of 405 feet from the mouth of the tunnel and 200 feet vertical from tho surface. The vein is 20 feet wide, and is well mineralized. It is enclosed by greenstone and slate walls. A mill test shows results ranging ahout $4.50 per ton in free gold, which, with the sulphurets, will run the value up to $10 per ton. Tunnel No. 1, heing 700 feet south of the point where the vein was encountered in development work done in tunnel No. 2, shows the ore hody to he large and extensive. The Belle of France gives promise of being a valuable property.

THE BOSS MINE.—W. L. Morris of the Boss mine denies the report that the mine is about to be sold, but says the company is going ahead and putting up better works and preparing to work the mine in a thorough and systematic manner.

NEW STAMP MILL.—A new stamp mill has been ordered for the Daisy Hill mine, Grass Valley, to crush tbe quartz and pay ore, together with the ore on the old dumps which, it is thought, will give good returns.

ASSESSMENTS.—The Live Oak Consolidated Mining Company has levied an assessment of ten cents per share, delinquent April 8th.

The Grizzly Ridge Mining Company has levied an assessment of three-fourths of a cent per share, delinquent May 10th.

The Odin Gold and Silver Mining Company has levied an assessmeut of four cents per share, delinquent April 26th.

Plumas.

RICH CHANNEL AT MCREA RIDGE.—*National-Bulletin:* A strike has been made at McRea Ridge hy the syndicate which has the Franklin and Beckwith Consolidated gravel mines bonded. During the past summer and winter the company has had a force of men at work running a tunnel to open up an ancient river channel known to exist in tbe ridge. Tbe miners, in driving this tunnel into the mountain, cut into the channel and found a pay streak twenty-five feet wide. the gravel from it yielding from $20 to $200 to the carload.

These properties are five miles southwest of Johnsville, in both Plumas and Sierra counties, in a section which produces very coarse gold. A few years ago tbe owners of one of the mines worked a break from the channel by the hydraulic process. Although operating in a small way only, in about three years $50,000 was realized, most of it very heavy gold. One nugget weighed about $3400, and it was no uncommon thing to secure pieces valued at from $100 to $1000.

However, what at that time was thought to be a regular gravel channel was soon exhausted, and it became evident that the deposit had been pushed out of or had broken from an ancient channel in McRea Ridge. Abont a year and a half ago Mr. Doolittle, of Dutch Flat, visited the mine. Appreciating the favorable opportunity for opening up a rich drift mine of great extent in McRea Ridge, he interested with himself A. N. Towne and several other magnates, secured bonds on a few locations owned respectively by the Franklin and Beckwitb Consolidated companies (the purchase price agreed upon being $150,000) and last summer began running a tunnel, not, however, employing a large force nor prosecuting the work very energetically. If the rich strike proves what it is reported to be, the syndicate will have one of the best gravel mines in tbis part of California, and no doubt will operate it accordingly. The new railroad completed to Mohawk, and a big and prosperous mining camp at McRea Ridge, would make things boom in that part of the county.

Riverside.

GOLD GOING TO WASTE.—*Reflex:* The Briggs mine, near Winchester, yielded 3¼ pounds of gold from a nine-days' run. The machinery in use is crude and much gold goes to waste.

Sierra.

A CHAPTER OF ACCIDENTS.—One of tbe boxes of the dynamo in the hoisting works at the Empire mine, in Gold Valley, was burned out last Friday. On Saturday five wires of the armature were burned out, rendering the machine useless until repairs are made. Tbe same day the front part of the furnace at tbe chlorination works, for a distance of 12 feet, caved in, caused, it is supposed, from poor brick. It will take two or three weeks to make tbe repairs, and in the meantime the mine will be closed down.

Trinity.

CANYON CREEK.—Ralston & Spencer, on Fisher gulch, bave cleaned out the tunnel on the Fisher gulch mine and are driving ahead.

About three-quarters of a mile from the Fisber gulch mine G. L. Bailey is running a tunnel to tap the ledge. The rock goes $20 to $25 a ton.

The lessees of the Cbloride mine have resumed work for the summer. The mill wbich was crushed by the snow last winter was but little damaged.

NEVADA.

WORK AT AUSTIN.—Elko *Independent:* The Austin Mining Company has a large supply of concentrating ore on hand, and E. W. Brownell will start the concentrator about the first of April. The company paid off on the 15th, their being between fifty and sixty employes on the payroll, and the concentrator will increase the uumber by fifteen or twenty.

THE COMSTOCK MINES.—At the Consolidated California & Virginia there bas been a considerable falling off in both the quantity and quality of the ore produced, hut it is to be hoped that this is only temporary. The yield the past week was fifty-two tons of the average value of $46.92 a ton. However, ore is still heing obtained in a number of places, and in one place on the 1650 level is a streak six feet in width that averages $60 a ton.

The Savage is yielding about 130 carloads of ore a week, the average assay of which is $28 a ton. Last week the company sent to the Carson Mint hullion to the value of $10,399.

Siuce repairing damages due to the late smash-up of machinery, the Crown Point Company have sent twenty-eight railroad carloads of ore to the Mexican mill, Carson river. This ore is gold-hearing quartz.

The Belcher, Hale & Norcross, Ophir, Justice, Chollar and Occidental are all yielding small amounts of good ore. At the Occidental ore is now heiug obtained on the 500 level that averages $40 a ton.

SIERRA NEVADA.—Have started an east crosscut from the southwest drift, started at a point 540 feet from the mouth of the Layton tunnel; advanced 39 feet during the week; face in porphyry, clay and quartz.

BULLION.—The west drift from the 820 level has been advanced during the week 14 feet; total length, 1433 feet; face in soft porphyry with a srrong flow of water.

ALPHA.—The east crosscut from the north lateral drift, 145 feet north of the main west drift, has heen extended 12 feet; total length, 24 feet; face in porphyry and quartz, from whicb there is a strong flow of water.

UNION SHAFT.—The joint west crosscut from the south lateral drift near the south line of the mine, 1520 feet west of the shaft, 900 level, has been advanced 15 feet during the week; total length, 600 feet; face in a formation of clay, quartz and porphyry.

Tbe joint east crosscut No. 3, from north lateral drift, 600 feet north of west drift, 1520 feet west of shaft, 500 level, has been advanced 20 feet: total length, 220 feet; face in porphyry and clay, witb small flow of water from it.

ALTA.—During the past week the north drift, 910 level, was advanced 18 feet; total length, 198 feet; quartz and porpbyry in the face. Arc casing above the 825 level in a streak of good ore 18 inches thick, the average assay value of which is about $40 per ton.

The official letter from the Occidental Con. mine states that the north drift from the west crosscut on the 500 level is now in 47 feet, and continues in ore averaging $41 per ton.

The official letter from the West Consolidated Virginia & California mine says that tbe west crosscut run from a point 320 feet north of the 1100-level station has been extended 12 feet, and is now in a total distance of 1474 feet; the face is in hard porphyry, carrying seams of quartz. The flow of hot water and temperature are the same as when last reported.

TWO ASSESSMENTS.—The North Truckee Drain Ditch Company of Reno has levied an assessment of $3 per share, delinquent April 19th. The Union Ditch Company of Reno has levied an assessment of 25 cents per share, delinquent April 18th.

ALASKA.

GOING TO THE YUKON.—The spring emigration to the Yukon gold fields has begun. On the 10th inst., nearly 200 Yukon miners had reached Dyea, 300 miles beyond Juneau, and tbe prospectors were hauling tbeir sleds upon slush ice up tbe great Dyea canyon toward the Yukon. More dogs bave been taken out from Juneau than ever before and the last steamer took up twenty-two from Puget Sound. They haul the prospectors' outfits over the ice and snow, greatly lightening the labor of the trip. William Liggett, who has beeu mining on the Yukon for six years, has returned to Juneau with glowing accounts of the rich finds made last season on Forty Mile, Sixty Mile and Miller creeks. Last season several dozen miners took gold worth $150,000 out of Miller Creek. So far the Discovery claim and seven others adjoining it on Miller Creek have yielded the greatest returns in gold nuggets, exceeding the yield of any other claims in the Yukon Valley. There was twelve feet of surface dirt upon the Discovery claim, which had to be sluiced off before pay dirt was struck on bedrock. The sluicing has to be done quickly, as the Yukon season lasts only sixty to ninety days.

ARIZONA.

THE NORTHERN PLACERS. — Yuma *Times:* Porter Laird is making big wages by dry wasbing, near Ebrenberg.

The Martinez company, east of Ehrenberg, are also doing well on tbeir ground.

Frost and his partner are located five miles east of Tyson's, and they have a shaft twenty feet deep. Every shovelful is rich.

Tbe Gray cement crusher, northeast of Ehrenberg, works satisfactorily aud prospecting for more material is now being done.

A steam arrastra is located a mile north of Tyson's, and is doing custom work on rich quartz.

Plomosa district is full of dry wasbers, and everybody seems to be making wages.

AT ROCKY PASS.—A stamp mill is to be built at the Rocky Pass mine, Cberry creek district, owned by Geo. Sines and T. H. B. Smitb. This mine is a shipping property, the ore averaging $40 to $60 gold per ton.

BRITISH COLUMBIA.

NEW DENVER DISTRICT.—*Miner:* At the No. 1 fifteen tons a day are being put tbrough the concentrator at Ainswortb, which is running day and night. The mine and the concentrator are employing about thirty men, most of whom are steady, hard-working Nova Scotians. Since January 1st 200 tons of ore have been shipped from this mine to the smelter at Pilot bay.

The Little Pbil and the Black Diamond claims are making a good show. Seven men are working on the joint properties, which have sent out 255 tons to the smelter at Great Falls, Mont., since the heginning of the year. The smelter gave the high return of 700 ounces to the ton for some picked ore.

Work has been commenced on the Rand and on the Indicator, a northwest extension of the No. 1. In June the "Mile Point" will he up again. Ore from this latter property bas assayed as high as 400 ounces to the ton, with ten per cent of lead.

Thirty-five men are at work on the Blue Bell, across the lake, under H. Stevenson, and they are sending down 150 tons a day to the smelter at Pilot bay.

A STEP UPWARDS.—The starting of the smelter at Pilot Bay marks an era in the history of the Kootenay mining district. The district generally is one of the roughest in North America, and until railways were constructed and steamboats took advantage of its magnificent waterways it was practically inaccessible. Three railways now tap it—the C. P. R. to the uorth, the Great Northern and the Nelson and Spokane line to the south. For years the project hung fire. To-day its furnace is producing ingots of silver-lead.

COLORADO.

CRIPPLE CREEK.

A LARGE OPERATOR.—Besides the great Independence mine, Mr. Stratton is now working the Portland No. 2, the Logan, the Eagles and the Yankee Girl, and the Caledonia is heing worked under lease. He is buying new properties whenever he finds an investment to his liking, and has been about the only heavy cash investor in the Cripple Creek district for a year past.

CONTROL OF THE VICTOR.—*Republican:* Report has it tbat the Victor mine at Cripple Creek is wanted by a French syndicate and that G. P. Walsh bas just completed his examination on which the decision of tbe foreign investors will be based. The Frenchmen bought 45,000 sbares of the stock at $3.50 and have had dividends which satisfy them that Victor stock at par is better than South African investments, with which they are more familiar, so they are now dealing for a control of the company, and it is claimed have an understanding with D. H. Moffat and Eben Smith for the purchase of their holdings at about $5, and that only the report of the expert is needed to complete the sale. The Victor is incorporated for $1,000,000, with shares $5 each.

There is now a perfect furore for South African gold stocks in Paris, and the sale of the Victor is likely to open the way for many other investiments of French capital in the Cripple Creek district. Professor Walsh has examiued the Buena Vista mine and it may he taken up by the same parties.

PIKE'S PEAK MINE.—Cripple Creek *Times:* The last two carloads of ore from the Osborne lease on the Pike's Peak mine, returned $13,132 and a sack of twenty-nine pounds gave returns of $305.

TELLURIDE.

RENEWAL OF WORK.—*Republican:* Arrangements have been made for the renewal of active work on tbe Keystone placers and tbat with the opening of the season the big hydraulic giant will agaiu be started to washing down its rich banks of auriferous gravel. The presence of gold in those banks to as high a value as $2.50 per yard has been demonstrated in tbe past.

RICO.

RICO'S SHIPMENTS.—*News:* The following is the number of carloads of ore sbipped from the various mines of Rico since January 1, 1895: Blackhawk, 71; Rico-Aspen, 82; Enterprise, 48; Princeton, 23; Swansea, 1; Munn Bros. (sampler), 3; Sberidan, 24; Pigeon, 4; Iron Clad, 1; South Park, 2; iron Mine, 1; total, 260.

IDAHO.

AT CHLORIDE CAMP.—The Webber Mining and Milling Company's plant started up about a week ago with fifteen men, since which time they have been turning out twenty-five tons per day. Shipping has already commenced. The ore is free milling, and, while not extra rich, is easily handled, and there is enough in sight to run the mill a year.

GENERAL ACTIVITY.—An unusual amount of mining activity is going on in the Gibbonsville and Shoup districts. The building of a forty-stamp mill by the American Development and Mining Company and other developments of the Barclay property will give this part of Idaho a substantial and lasting boom.

News from the Willow creek mining district is encouraging. Prout & Richardson have a stamp mill nearly ready for operation, and much development work will be done there this season. Posten & Critzer, of Caldwell, are running a sixty-foot tunnel on the Hoosier ledge and report excellent indications.

MONTANA.

ASBESTOS.—A large deposit of asbestos was recently discovered twelve miles northwest of Dillon, Mont., and can be traced for a distance of 2500 feet.

OREGON.

BAKER.

A gold nugget weigbing a fraction over $60 was picked up in tbe gulch below tbe Virtue mine, one day recently, by Mr. Casebeer, who intends placer mining on tbis claim in a few days.

STRUCK A POCKET.—*Oregonian:* Frederick Holton came here from Baker county this morning, carrying with him a valise filled with gold nuggets, the weigbt of wbich made him stagger. Some of the nuggets weigh $3000, and the whole treasure was dug out of a pocket by himself and his partner, Henry Sanderson, witbin the past four days. Holton and Sanderson had been prospecting in the hills of Baker county almost a year witbout making "grub" money, and a week ago they were about abandoning the field and returning to California. On Tuesday last they saw some float rock close to their temporary camp, and following it up they struck a pocket, from which, Holton says, they have already taken $40,000. He believes that there is $500,000 or more of gold in that depository, which can he taken out with no cost beyond their personal labor. [The above sounds well, but needs verification.—ED.]

BOHEMIA DISTRICT.

TO BE SOLD.—The Annie Consolidated Mining Company's property in the Bohemia district is advertised in the Roseburg papers to he sold at sheriff's sale on Thursday, April 4, 1895, on a judgment in favor of James Pitcher, for $614 39, and $61 25 costs and dishursements.

UTAH.

TRANSFER OF THE CAROLINE.—*Tribune:* The formal transfer of the Caroline mine to the Bullion-Beck Company was effected yesterday at a straight-away price of $130,000. That amount was $15,000 less than the price quoted when Mr. Badlam so vigorously protested against the purchase.

Mr. Badlam came all the way from San Francisco to protest against the proposed purchase of the Caroline by the Bullion-Beck Company, claimiug that tbe latter already owned all that was valuable of tbe Caroline. Mr. Badlam also served a written notice upon each of the directors of the Bullion-Beck Company, in which he stated that he would hold them personally respon-

sible if they concurred in the purchase and permitted it to go through.

As previously stated, the Caroline is to be under the active management of Captain Hank Smith.

The Caroline is showing up splendidly, although it has only been worked in a comparatively small way recently, and big changes are expected in the immediate future.

THE SILVER KING.- Speaking of the new find in the Silver King mine, the Park City *Record* says that new bodies of ore are uncovered so rapidly, and show up so strong and rich, that even the oldest men underground become bewildered and wonder if the end will never come. Since the power drills have been in use, a number of prospecting drifts have been run in all directions and ore found everywhere, but the cap sheaf was placed on the shock yesterday, when the shaft, which is being sunk to the 1100 level, dropped into a fine body of rich ore.

WASHINGTON.

SLATE CREEK DISTRICT.—The steamer City of Ellensburg is chartered by Messrs. Clark & Co., who are shipping several carloads of mining machinery into the Slate creek mining country. About fifty men will take passage on the boat for the mines, thirty-eight being practical miners from the Sound who are hired by Messrs. Clark & Co. to work in the mines, the rest being miners and business men looking for locations. The present indications point to a prosperous season for river traffic on the Columbia between Wenatchee and the mines.

Miners from the Squaw creek country confirm the report of the rich strike two miles from Methow City on the Doerr ranch.

Technical Society of the Pacific Coast.

The next regular meeting will be held on Friday, April 5, 1895, in the rooms of the Society in the Academy of Sciences' building, 819 Market street.

On this occasion Mr. J. D. Isaacs will present a paper entitled "Stopping a Troublesome Slide at a Summit Tunnel," which discusses the successful engineering results of overcoming physical difficulties. Members are requested to attend and invite any friend interested in the subject.

It is hereby announced that this Society has become a member of the Association of Engineering Societies, and that its professional papers will hereafter appear in the journal of the Association published in Philadelphia. All members are entitled to receive this journal without additional charge to them, the subscription beginning with the March number, which will appear in due time.

In this connection it is earnestly requested that all members of the Technical Society who have not placed themselves in good standing to do so at the earliest opportunity, so that the Society may not lack the funds to meet the obligations to the Association.

By order of the President.

OTTO VON GELDERN, Sec'y.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING MARCH 19, 1895.

536,169.—WAVE MOTOR—C. L. Caldwell, Los Angeles, Cal.

536,069.—WAGON TONGUE SUPPORT—J. F. Dehm, San Diego, Cal.

535,955.—BURIAL CASE—T. C. Nativel, Los Angeles, Cal.

535,956.—WINDMILL—C. A. Norcross, Reno, Nev.

536,157.—NECKTIE FRAME—G. W. Ritz, S. F.

535,984.—GAS ENGINE—H. Swain, S. F.

535,930.—WINDOW SCREEN—W. Thompson, Santa Cruz, Cal.

536,111.—STRINGING PIANOS—C. S. Neber, San Jose, Cal.

535,970.—ADVERTISING DEVICE—C. L. Whipple, Los Angeles, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

THE Altham motor, about which so much has been said and sung, is being exhibited in Boston and is regarded as a success. It is a new type of turbine wheel operated by a small jet of steam or a hydrocarbon fuel which is fed automatically into a generator, where its combustion produces a gas under heavy pressure, which in turn is fed to the turbine in the same way that steam is now injected. The motor now on exhibit is cylindrical in form, about 18 inches in length by about 12 inches in diameter. It is coupled directly to the shaft of the armature of an old type of dynamo, and with about 14 horse power of steam energy it generated quite easily current for 100 lamps of 16 candle power capacity.

THE battle of Waterloo was fought 80 years ago. There are now living 23 known survivors of that great conflict. Of these 14 live in England, six in France and three in this country. The battle of Waterloo was fought 50 years before the close of our civil war. Within 50 years, therefore, it is probable that the number of Union veterans or those who fought for the Confederacy will be reduced to very small proportions. The average of human life is increasing, and though the hardships of their war experience have shortened many lives, it seems probable that as many, if not more, will survive of those who took part in our civil war as there are now survivors of the battle of Waterloo.

THE air-tight compartment theory of building ships was copied from a provision of nature shown in the case of the nautilus. The shell of this animal has forty or fifty compartments, into which air or water may be admitted to allow the occupant to sink or float as he pleases.

ONE of the most peculiar coals found in the United States is the lignite of the Dakotas. It looks like slabs of wood blackened, and the knots and burls in the timber are plainly to be seen.

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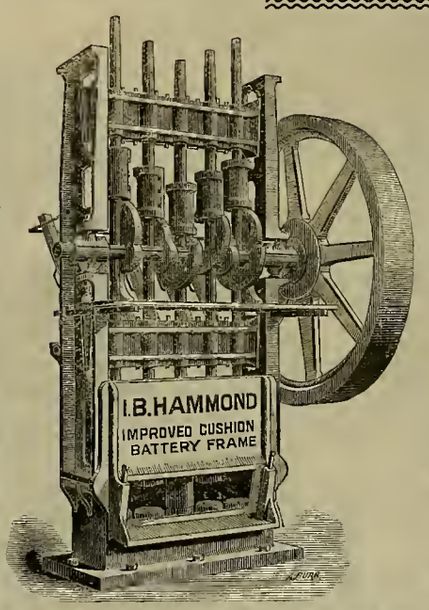

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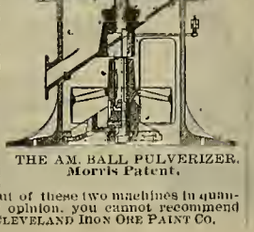

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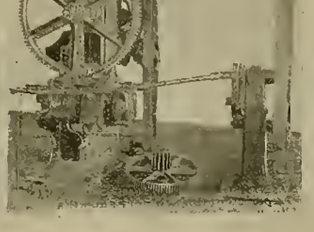

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Uses of Sawdust.

One of the methods whereby profit has been made from sawdust is the manufacture from it of oxalic acid, which is a simple process, producing a material in wide commercial demand in the art of dyeing and other chemical arts. As intimated, the process is not only simple, but the outfit for conducting it does not involve a large investment. The principles involved are not complicated, and the process can be carried out by cheap labor under the superintendence of a fairly intelligent director.

Oxalic acid is frequently met with in the vegetable kingdom, especially in combination with gases which destroy its poisonous character. Oxalate of lime is found in considerable quantity in the rhubarb plant. Oxalate of potash is found in the sorrel and oxalate of soda in salicornia and sal soda. Formerly the acid was obtained from the sorrel, Oxalis acetosella, but more recently from sugar by the action of nitric acid upon it. The nitric acid and sugar are boiled for some time, then evaporated to dryness, and the oxalic acid formed is purified by crystallization from water. A much cheaper material than sugar is sawdust. In this case an alkali must be employed instead of an acid, as well as at a higher temperature. The operation is conducted in an iron vessel of suitable size and shape, and either caustic soda or potash is employed, the yield being greater with the latter.

Some experiments made go to prove that a mixture of forty parts of caustic potash to sixty parts of caustic soda will produce as large a yield as when potash alone is used, provided the operation is performed in shallow vessels with thin layers of the material, avoiding, as far as possible, the fusion of the mass. Soft woods, such as pine and fir, produce larger quantities of oxalic acid than hard wood like oak. The proportion of the wood to alkali should not exceed 75 to 100, and the temperature should be about 480° F.

Natural Bridge in Oregon.

One of the chief of the west coast natural curiosities is the "Titan's Bridge," situated in Douglas county, Oregon, and about eighteen miles from Oakland. It is not on such a grand scale as the famous "Natural Bridge" of Virginia, but will, when its whereabouts become generally known, rank high among American oddities of nature. This Oregon natural bridge was discovered only a few years ago by a Californian of the name of Magee. The canyon spanned by its arch is 91½ feet wide at the base between side walls, and the arch itself only lacks 4½ feet of being an even 100 above the little stream that runs beneath. The rock stratum which spans the canyon and forms the bridge is 30 feet in thickness, exclusive of 3 or 4 feet of earth, which supports a few straggling trees. It has already become a great resort for Oregonian outers, and a large hotel on a plateau near the western approach of the bridge is among the near future probabilities.

Artificial Whalebone.

According to *Le Genie Civil* the Munck process for the manufacture of artificial whalebone consists in first treating a raw hide with sulphide of sodium and then removing the hair; following this, the hide is immersed for a period of twenty-four to thirty-six hours in a weak solution of double sulphate of potassa and is then stretched upon a frame or table, in order that it may not contract upon drying. The desiccation is allowed to proceed slowly in broad daylight, and the hide is then exposed to a temperature of from fifty to sixty degrees. The influence of the light, combined with the action of the double sulphate of potassa absorbed by the skin, renders the gelatine insoluble in water and prevents putrefaction, the moisture, moreover, being completely expelled.

Thus prepared, the skin is submitted to a strong pressure, which gives to it almost the hardness and elasticity which characterize the genuine whalebone, with the advantage that before or after the process of desiccation any color desired may be imparted to it by means of a dye bath. The material can be rendered still further resistent to moisture by simply coating it with rubber, varnish, lac, or other substance of the kind.

100,000,000 Acres.

The United States Surveyor-General for California estimates the area of the State of California to be 100,395,000 acres, as follows:

	Acres.
Agricultural and mineral lands surveyed to June 30, 1892	61,887,392
Agricultural and mineral lands unsurveyed	26,211,501
Private grants patented	8,383,375
Private grants not settled	341,650
Indian military reservations	318,631
Lakes, islands, bays and navigable rivers	1,531,700
Swamp and overflowed lands surveyed	1,635,227
Swamp and overflowed lands unsurveyed	85,524
Total	100,395,000

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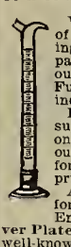
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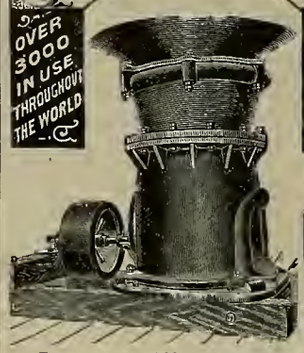
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Witwatersrand Gold Product.

A report by Hamilton Smith upon Witwatersrand gold fields was published about two years ago, based upon an examination of the Rand in 1892. He has lately revisited the Transvaal, remaining there from August to December, 1894. In the former report his belief was stated that in a few years the gold product from the Rand would increase to a value of over £10,000,000 per annum, and that a total yield of £325,000,000 in gold could be reasonably expected from that district.

Since 1892, work has been carried on more vigorously than ever before in about sixty mines owning claims at and near the surface outcrop of the main reef series. Many vertical bore-holes have been put down by diamond drills, one having reached the depth of nearly 2500 feet. Mr. Smith believes that, at a horizontal distance of three miles from their outcrop, the reefs of the main series are probably 10,000 feet, or about two miles, beneath the surface. At a distance of two miles, their depth, as a rule, will be not quite one and one-half miles.

The vertical depth to which these mines can be worked with profit will chiefly depend upon the value of the ore, the amount of capital required for plant and development, the quantity of water to be pumped and the temperature of the ground. With the abundant supply of coal in the Rand the cost of hoisting the ore from great depths will not be a very important item. None of the mines on the Rand have thus far encountered large inflows of water. In regard to the heat, Mr. Smith was able to make some careful determinations of the temperature in the deep bore-hole before spoken of. These show a temperature of 67.2 Fahr. at a depth of 200 feet, increasing in a regular manner to 95.3° at a depth of 2494 feet. This indicates a temperature of about 100° at a depth of 3000 feet. At the depth of 3500 feet the high temperature will probably cause a serious addition to the mining costs. Mr. Smith thinks that, with most of the mines, a vertical working depth of but little over 3000 feet can be assumed as the limit with which they can be operated at a profit, while with richer or thicker ore—such as is now found in a few of the outcrop mines—a limit of something over 3500 feet in depth seems reasonable. Should, however, the price of skilled labor and the cost of supplies decline in time to a European level, still deeper limits would be possible.

As to the continuance of the gold with increased depths, there is no sign whatever up to the present time of any change in the grade of the ore. Present indications show that the average values of the reefs remain unchanged to a vertical depth of 1000 feet—say 1750 feet upon their dip.

Mr. Smith reports that in 1894 the value of the Rand gold bullion was £7,000,000, and this without any increase from the new deep-level mines. These latter will become fairly productive in 1897, so for that year a product of fully £10,000,000 can be fairly expected. "Judging from present appearances, the maximum product of the Rand will be reached about the end of this century, when it will probably exceed £12,500,000 per annum." The Rand for 1894, with its product of $35,000,000, stands third in the world, the United States being first with its output of over $45,000,000, and Australasia being probably second with a product of about $40,000,000. In 1849 the world's product of gold was about $30,000,000, which increased to something over $150,000,000 in 1853, owing to the discovery and working of the rich placers of California and Australia. From 1853 the yield steadily declined until, in 1883, it had fallen to less than $100,000,000. Since 1887 the yield has advanced by leaps and bounds until for 1894 the product has most probably amounted to fully 8,600,000 ounces of fine gold, worth over $182,000,000—an output certainly much greater than that for any previous year in the history of the world. It has been generally accepted that one of the principal causes of the rise in the price of standard articles from 1849 to 1860 was due to the influx of gold from California and Australia. Will the same rise in values, measured by the ounce of gold, take place in the coming five years? This is a question of vast importance to all of us—from the richest capitalist to the poorest laborer.

From the Rand mines, since their commencement in 1887 up to December 31, 1894, Mr. Smith estimates that 10,110,000 tons of ore (2000 pounds each) have been extracted, yielding 6,544,584 ounces of gold bullion, worth about 69s per ounce, and thus having a gross value of about £22,600,000. The dividends paid by the producing mines during the same period amount to £4,484,541; but of this sum nearly £200,000 was unquestionably not fair mining profit, so that £4,300,000 can be assumed as having been the net return, or nineteen per cent of the output. For the year 1894 there was milled 2,827,365 tons, coming from fifty producing mines, yielding 2,024,162 ounces of bullion, worth about £6,980,000, and the dividends declared by them for the year amount to £1,406,266, being twenty per cent of the output. On the other hand, several of these mines were operated at an actual loss in 1894. From 1887 to 1894, inclusive, the profits made in actually working the mines of the district have been more than the losses, although in the years 1887-90 large sums were expended in developing mines, many of which thus far appear to be worthless.

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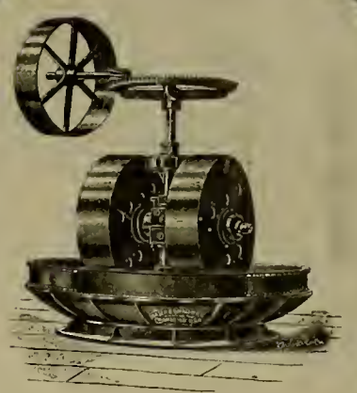

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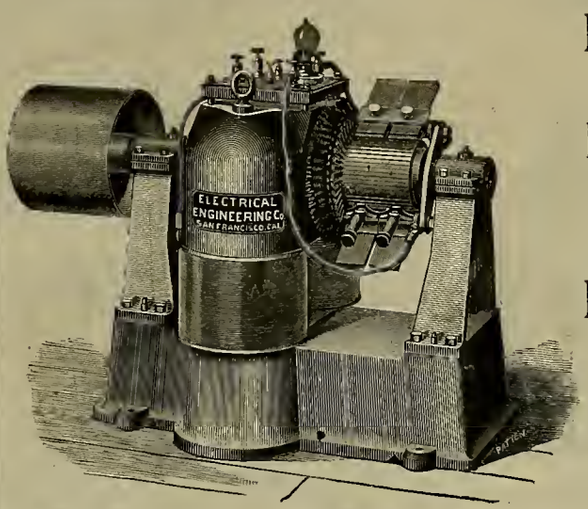

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Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us enables us to give advice which will save inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 220 Market St., S.F.

Market Reports.

The Markets.

SAN FRANCISCO, March 28, 1895.

The five States of Montana, Colorado, Utah, Idaho and Nevada are directly concerned, and the rest of the Union indirectly concerned, in the gratifying advance of silver. The MINING AND SCIENTIFIC PRESS rejoices, not at the verification of its predictions, but because it is a general vindication of what all friends of silver have claimed—viz., that the natural trend of events and the public requirement would overcome the manipulations of those who trade upon the necessities of the nations and the weakness of legislators. In this regard, it is noticeable how little notice has been made of the resumption of free coinage in India by Great Britain. For the past sixty days, as receutly noted in these columns, free coinage is now going on in Bombay, where England is coining "the British dollar," containing 416 grains of silver. England finds it profitable to buy silver even at 64c, to-day's quotations, as 416 grains in a dollar means just twice 64c for silver hullion. English papers say this is done "for the relief of the banks." Whatever the motive, the fact remains the same. The "seigniorage" at the Bombay mint is one per cent.

A suggestion herein made some time ago—that the market for silver could and should be made and the rate set here, and not in London, meets affirmative echo in many quarters. The scheme is feasible, and some day to that it will come.

Says Dan De Quille: "The 'kept' papers of the gang in the East who are working the gold cinch on the producers of the land, are always talking about the danger of Europe unloading silver upon this country. The fact is that England and other countries across the water have use for all the silver they possess and all they can get from this country. Every week we send across the sea to the Old World from $400,000 to half a million in silver. If there is no silver needed in the other countries of the world no such amounts would he taken. In the last eight months over $23,800,000 in silver has heen sent from New York to London. Of course, Johnny Bull finds a place for this silver and is making a hig thing out of it."

"Instead of sending their silver hullion to London via New York our people should send it to China and Japan via San Francisco and use it in the purchase of tea, silks and other goods of the Orient, for which there would he ready sale here aud in Europe at good prices in gold. It would not be long after the shipments of silver were thus turned away from New York and Londou before the manipulators, here and across the water, who have heen putting their own price on our silver (and thus putting their own price on all the products of our farms and planters) for the past twenty years, would hegin to haul in their horns. It is an experiment that should he made, ard just now is a good time in which to make it. A syndicate could easily he formed to run the whole business, and it would soon be the strongest in the world."

New York Metal Market.

NEW YORK, March 28.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.

COPPER—Brokers', 9.37½c; exchange, 9.30c.

LEAD—Brokers', $3.15; exchange, $3.12½.

TIN—Straits, 13.90@14.10c.

SPELTER—Domestic, $3.15.

New York Prices.

NEW YORK, Mar. 28.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	28⅝	63	9 40	3
Saturday	28⅞	63⅝	9 35	3 00
Monday	29⅛	63¾	.....	.....
Tuesday	29⅛	63¾	.....	.....
Wednesday	29½	64	9 35	3
Thursday	29⅝	64	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loaus, % per annum.....7@8
Commercial Loans, prime.....6@8
Call Loans, gilt edged.....7@8
Call Loans, mixed securities.....7@8
Mortgages, prime, taxes paid by lender.....7
New York Sight Draft.....7½c
New York Telegraphic Transfer.....10c
London Bankers' 60 days.....$4.88¼
London Merchants.....$4.86
London Sight Bankers.....$4.89½
Refined Silver, per ounce.....64c
Mexican Dollars, nominal.....53½@54

San Francisco Metal and Coal Market.

ANTIMONY.

Per lb	—	@	10

BORAX.

Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5

COPPER.

Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14

TIN PLATE.

Per bx	5 25	@	6 00

IRON.

American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00

STEEL.

Englisb, lb	14	@	16

NAILS.

Wire			$2 90
Cut			2 65

PIG TIN.

Per lb	15	@	16 00

ZINC.

Sheet	8¼	@	

LEAD.

Pig	—	@	3 90
Bar	—	@	4 20
Sbeet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* tban B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do, "		"	1 45

QUICKSILVER.

Home trade, per flask	37 00	@	— —

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied,	Deling't and Sale.	Secretary.
Belcher S M Co, Nev	50	25c	Mar 5,	Apr 30	C L Perkins, 309 Montgomery
Booth G M Co, Cal	5	2c	Feb 18,	Mar 25, Apr 17	Geo R Spinney, 310 Pine
Brunswick Con G M Co, Cal	8	2c	Mar 20,	Apr 20, May 15	J Stadtfeld Jr, 309 Montgomery
Bullion Con G M Co, Cal	1	10c	Feb 19,	Mar 25, Apr 25	C A Grow, Mills Building
Challenge Con, Nev	18	5c	Feb 19,	Mar 26, Apr 16	C L McCoy, Mills Building
Con New York, Nev	13	5c	Feb 19,	Mar 26, Apr 17	Chas E Elliott, 309 Montgomery
Crown Point G & S M Co, Nev	65	25c	Mar 12,	Apr 16, May 7	Jas. Newlands, Mills Building
Eureka Con, Nev	13	25c	Feb 19,	Mar 25, Apr 11	H P Bush, 134 Market
Granite G M Co, Cal	2	1½c	Jan 2,	Mar 9, Apr 6	Wm Schaw
Gray Eagle M Co, Cal	39	5c	Mar 2,	Apr 8, Apr 26	A P Swain, 309 Montgomery
Inyo Marble Co, Cal	26	10c	Jan 21,	Mar 6, April 5	W W Sargeant, Mills Building
Iowa M Co, Nev	20	5c	Mar 6,	Apr 9, Apr 27	R L Thomas, 419 California
Julia Con M Co, Nev	26	5c	Feb 13,	Mar 20, Apr 10	J Stadtfeld, Jr., 309 Montgomery
Justice M Co, Nev	58	10c	Feb 9,	Mar 14, Apr 3	R E Kelly, 309 Montgomery
La Candelaria M Co, Mex	8	$2	Mar 7,	Apr 9, Apr 27	G A Hill, 22 Market
La Grange H M Co, Cal	10	35c	Feb 23,	Apr 1, Apr 22	A Halsey, 328 Montgomery
Occidental Con M Co, Nev	18	10c	Mar 20,	Apr 23, May 15	A K Durbrow, 309 Montgomery
Osborn Hill G M Co, Cal	4	25c	Feb 27,	Apr 4, Apr 24	R R Grayson, 331 Pine
Reed M & M Co, Nev	1	2c	Dec 31,	Feb 11, April 3	John H Isham, room 33, Mills Bldg.
South Eureka M Co, Cal	17	1c	Feb 20,	Apr 1, Apr 22	A Halsey, 328 Montgomery
Starlight Mining Co, Cal	5	10c	Feb 11,	Mar 18, Apr 8	H R Williar, 214 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Champion M Co, Cal	J F Holling, 113 Crocker Building	April 9
Bulwer Con M Co, Nev	J E Jacobus, 309 Montgomery	April 10

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00
Greta	7 75
Nanaimo	6 50
Gilman	6 00
Seattle	6 25
Coos Bay	6 00
Cannel	10 50
Egg, bard	13 00
Wallsend	7 50
Scotch Splint	7 75
Brymbo	7 75
West Hartley	8 75

TO ARRIVE—PER TON.

Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	11 00	@	— —
Egg, bard	12 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'	75c ₱ bbl		
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, March 28, 1895.

Throughout the week there has been little husiness and low prices for the little done. The advance in silver or the improved appearance in the Comstocks have little to do with the street. Money, nerve and a leader are needed, and the lack of all three makes things spiritless. The chipper bears about the same relation to stock business that the check guerilla does to the faro bauk. Occidental showed a little life and Bodie was firmer. Con. Cal. advanced and to-day the market livened up a little.

The following illustrates the changes of the week:

Mines.	21	28
Alpha	$ 08	...
Alta Consolidated	25	...
Andes	...	$ 27
Belcher	...	40
Best & Belcher	80	...
Bodie	...	...
Bullion	21	21
Challenge	39	45
Chollar	51	49
Confidence	...	1 50
Consolidated California and Virginia	2 85	2 70
Consolidated New York	...	...
Crown Point	43	42
Excbequer	...	03
Gould & Curry	...	48
Hale & Norcross	1 15	1 20
Justice	...	17
Mexican	90	81
Ophir	...	1 60
Overman	16	...
Potosi	...	...
Savage	39	38
Sierra Nevada	80	80
Union	...	...
Utah	...	...
Yellow Jacket	56	57

San Francisco Stock Board Sales

SAN FRANCISCO, March 28, 1895.

9:30 A. M. SESSION.

100 Belcher	40	100 L Wasb	02
100 Chollar	49	100 Mexican	81
100 C. C. V.	2 70	100 Ophir	1 60
50 Crown Point	40	200 Savage	37
200 Excbequer	03	300 S. B. & M.	19
50 Gould & Curry	48	200 Sierra Nevada	80
200 Hale & Norcross	1 10	100	78
100 Justice	17		

SECOND SESSION—2:30 P. M.

100 Andes	27	100 Ophir	1 60
100	26	100 Occidental	15
700 Belcher	40	750	14
100 Bullion	21	400	13
100 Challenge	45	600 Sierra Nevada	80
50 Confidence	1 50	150 Savage	37
100 Crown Point	41	150	38
300	42	100 Seg Belcher	23
400 Chollar	51	500	22
500 H & N	1 2.	100 Silver Hill	03
100 Mexican	81	300 Yellow Jacket	57

ANTHRACITE COAL has been sold in New York recently at as low a figure as $2.75.

VAN DUZEN STEAM JET PUMPS

THE BEST IN THE WORLD.

Pumps any kind of Liquid. Always in order. Never clogs nor freezes. Fully Guaranteed. COST $7 AND UPWARD. Especially useful for Mines, Quarries, Pits, Wells, Clay Pits, Breweries, on Steamships, Ferryboats or any place where steam is available and liquid to be pumped. A full supply in stock. Address,

Jas. Linforth, 37 Market St., San Francisco.

Assessment Notices.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Grass Valley Mining District, Nevada County, California.

Notice is hereby given, that at a meetiug of the Board of Directors held on the 20th day of March, 1895, an assessment (No. 8) of Two cents per share wae levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, Nevada Block, San Francisco, California, or to the Treasurer, J. J. Halpin, 57 Broadway, room 87, New York City, State of New York, on or before the 20th day of April, 1895.

Any stock upon which this assessment shall remain unpaid in San Francisco, on the 20th day of April, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD JR., Secretary.

Office—Room 56, Nevada Block, San Francisco, California.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 20th day of March, 1895, an assessment (No. 18) of Ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room 68, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 23d day of April, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, togetber with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room 68, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

IOWA MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia City, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of March, 1895, an assessment (No. 20) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 2, 419 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of April, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on SATURDAY, the 27th day of April, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. L. THOMAS, Secretary.

Office—Room 2, 419 California Street, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Geo. W. Edwards, in the Blacklock Mine, near Placerville, El Dorado Co., Cal., to impound tailings behind a brush dam in Spanish Ravine; from Kelly & Matherly, on Rattlesnake Bar, near Auburn, Placer Co., Cal., to deposit tailings on bank of American River; from O. M. Henry, in the Dry Gulch Mine, near Volcano, Amador Co., Cal., to deposit tailings behind a dam below the mine; from J. K. Williams, in the Saw Mill Flat Mine, near Whiskytown, Shasta Co., Cal., to deposit tailings in an old hydraulic pit; and from Thomas Ewing, in the Mooney Placer mine, near Placerville, El Dorado Co., Cal., to deposit tailings in old hydraulic pit, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on April 1st, 1895, at 1:30 P. M.

THE CALIFORNIA DEBRIS COMMISSION having received an application to mine by the hydraulic process from George Wheeler, in the Grizzly Flat Mining Claim, El Dorado county, Cal., to impound tailings behind brush dams below the mine, gives notice that a meeting will be held at room 92, Flood building, San Francisco, Cal., April 1, 1895, at 1:30 P. M.

THE

Ore Deposits of the United States.

By J. F. KEMP, A. B., E. M., Professor of Geology, School of Mines, Columbia College.

Second Edition, Revised and Enlarged, New Illustrations.

A practical review of the ore deposits of this country. A valuable addition to up-to-date mining literature, of value to the Pacific coast. Sent postpaid upon receipt of price, $4.00. Address

Mining and Scientific Press,
220 Market Street, San Francisco, Cal.

PATENTS
DEWEY & CO.,
220 Market St., S. F.

RUPTURE!

It has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA. Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo County, California.

NOTICE.—There are delinquent upon the following described stock on account of Assessment No. 26, levied on the 21st day of January, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald	453	250	25 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin	414	200	20 00
W. D. Mansfield, Trustee	488	131	13 10
Geo. Dillman	420	980	98 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
Louis Vesarla, Trustee	308	1,000	100 00
Louis Vesaria, Trustee	346	307	30 70
Israel Luce, Trustee	397	1,000	100 00
A. F. Thanc, Trustee	447	500	50 00
Chas. E. Anderson	456	500	50 00
Chas. E. Anderson, Trustee	463	12,165	1,216 50
W. W. Sargeant, Trustee	482	1,250	125 00
W. W. Sargeant, Trustee	485	1,000	100 00
W. W. Sargeant, Trustee	488	745	74 50
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	514	500	50 00
W. W. Sargeant, Trustee	516	600	60 00
W. W. Sargeant, Trustee	518	1,000	100 00
Jos. Rosenthal	489	5	50
H. H. Noble, Trustee	523	4,000	400 00
H. H. Noble	524	100	10 00
Mrs. Hattie C. Baggs	305	800	60 00
Mrs. Hattie C. Baggs	306	379	37 90
Mrs. Hattie C. Baggs, Trustee	317	301	30 10

And in accordance with law, and an order of the Board of Directors, made on the 21st day of January, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 13, Third Floor, Mills Building, San Francisco, California, on FRIDAY, the 5th day of April, 1895, at the hour of one o'clock P. M. of said day, to pay delinquent assessments thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office—Room 13, Third Floor, Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

BOOTH GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Auburn, Placer County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 5) levied on the Eighteenth day of February, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amt.
Richard Chenery, Trustee	160	6,275	$125 50
Richard Chenery	17	5	10
Thomas Day, Trustee	148	500	10 00
Thomas H. Gordon, Trustee	68	1,000	20 00
Thomas H. Gordon, Trustee	112	100	2 00
Thomas H. Gordon, Trustee	114	100	2 00
Thomas H. Gordon, Trustee	116	100	2 00
Thomas H. Gordon, Trustee	117	100	2 00
Thomas H. Gordon, Trustee	118	100	2 00
Henry Gilman	38	300	6 00
Henry Gilman	175	1,000	20 00
E. S. Harrison, Trustee	177	1,000	20 00
J. W. Winter, Trustee	161	250	5 00

And in accordance with law, and an order of the Board of Directors, made on the Eighteenth day of February, 1895, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the salesroom of S. P. Middleton & Co., No. 30 Montgomery Street, San Francisco, California, on WEDNESDAY, the Seventeenth day of April, 1895, at the hour of Two o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

GEO. R. SPINNEY, Secretary.

Office—310 Pine Street, Room No. 28, San Francisco, California.

WANTED.

A competent man to canvass for advertisements for *The Colliery Engineer and Metal Miner* on the Pacific slope, with headquarters in San Francisco. Address with references,

THE COLLIERY ENGINEER CO.,
Scranton, Pa.

Coast Industrial Notes.

W. A. Hewitt, 11 First St., represents the Western Forge Co., of St. Louis.

Wellington coal importers have combined, and put the price up 50 cents per ton.

E. A. Rix has removed his machinery business to 11-13 First St., San Francisco.

—Eureka Mill owners can manufacture redwood lumber cheap enough to compete with Oregon pine in price.

—Parties from Puy de Dome, France, will start a factory in California for the preparation of crystallized fruits.

—The Beaver Hill Coal Co., with a $500,000 capital stock, has been organized to open new coal mines at Coos Bay, Or.

—There are 2200 carpenters in this city. Of that number, 1500 are employed at wages ranging from $1.75 to $2.25 per day.

—The Watsonville sugar factory, near Santa Cruz, has closed a long season's work. The total amount of beets handled during the season is estimated at 142,000 tons.

The Sacramento *Record-Union* has ordered five type-setting machines, which will do the work of thirty-five compositors. The machines will arrive about July 1st.

A lease has been taken of 2500 acres at Whittier, Cal., by Pennsylvania and New York operators Pickering Land and Water Company—and boring for oil will commence.

—The Hobart & Marlette estate owns a tract of timber land near Truckee, and now intend to work the timber into lumber. A mill and yards will be established at Boca or Truckee.

—The Pacific Coast Steamship Company has decided to put on extra steamers of light draught to call at the ports of Mazutlan, Altata, La Paz and Guaymas, in the Gulf of California.

—The Redondo iron mines, Redondo island, B. C., and the Glen iron mines, near Kamloops, have been bonded by an American firm, who are negotiating to establish iron works near Seattle.

—Shipments of wine to this city to fill the sale of 6,000,000 gallons to the California Winemakers' Corporation, have begun from Santa Clara county, which will furnish about 2,000,000 gallons, at 12½ cents a gallon.

—Professor Sanders, of Fresno county, gives it as his opinion that tea can be grown in several parts of California, but, by personal experience, says that the harvesting of it requires two days' work to produce one pound, worth fifty cents.

—San Francisco people are paying ten cents per pound extra for California prunes with a French label on the box. The *Democrat* thinks it is a wonder some of our miners never thought to put a European label on their gold; they might sell it at a big advance to the same people.

—The Washington bureau of equipment states that tests made of the Blue canyon, Washington, coal show that it has equal qualities to that of any other Pacific Coast coal yet tested—showed fixed carbon of sixty per cent. The results of the tests made by the Mohican corroborate the report thus far.

It is said that a syndicate of wealthy men are arranging to send an agent to China, believing that as soon as peace shall have been concluded between China and Japan the celestial empire will become the scene of wonderful development in railways, street car lines, factories and other means of internal improvement, and there will be opportunities for franchises or concessions which may lead to the making of large fortunes.

—Among recent pipe shipments is one of 1000 feet, 28 inch, three-sixteenths by Francis Smith & Co., to Honolulu, accompanied with a ninety-foot span beam bridge to carry it.

—The Keystone Foundry of Los Angeles has secured an outfit of iron-working tools from the Parke & Lacy Co., of this city. An Ingersoll-Sargeant compressor with drill has also been sent to the Osborn Hill Gold M. Co.

—A gasoline launch is being built to run between Sacramento and Red Bluff by George W. Kneass, the boat-builder. The launch will be forty-eight feet long, ten feet beam, and five feet deep. She will have accommodations for twenty passengers, and will be propelled by a gasoline engine of twenty-horse power.

The ruling in the Short Line case recently at Portland, Or., is a victory for the Union Pacific. Circuit Judge Gilbert and District Judge Bellinger decline to take the case out of the hands of District Judge Ryner of Wyoming, who originally appointed the Union Pacific receivers to be receivers also for the Oregon Short Line.

Flagstaff, Arizona, men, have organized the Durango, Flagstaff and San Diego Railroad Company to build a railroad from Durango, Col., to San Diego, a distance of 760 miles, to cost $6,000,000. The incorporators are D. M. Riordan, D. Babbitt, J. W. Francis, W. Hamilton and J. R. Kirkpatrick, who have subscribed $3,000,000.

—The California State Board of Trade has decided not to send an exhibit to Mexico, but to send one to the Atlanta Exposition. The following directors were elected to serve for a year: J. S. Emery, B. M. Lelong, Hon. L. W. Buck, J. Morrisey, J. S. Stabler, W. H. Mills, N. P. Chipman, J. P. Irish, C. M. Wooster, L. C. McAfee, M. L. McDonald.

—The Board of Directors of the Manufacturers' Association have elected the following officers: President, H. T. Scott; Vice-Presidents, Louis Saroni; W. F. Bowers and J. M. Davies; Treasurer, Andrea Sbarboro; secretary, Lewis R Mead; Executive Committee—R. S. Moore, James Sproule, Julian Sontagg, M. McGlynn and Louis Saroni.

THE JONES ROCK DRILL

IS THE

Only Successful Hand Power Drilling Machine Ever Invented.

It is strong, durable, reliable, simple, compact, light, easily handled and operated by one man, and will reduce the cost of rock drilling at least Fifty per cent.

Our handsomely illustrated pocket catalogue fully explains the features and workings of the drill. It should be in the hands of every mine owner, leaser, contractor and prospector in the West. *Send for it on application.*

If you are interested in Rock Drilling Correspond with us.

WE CAN SAVE YOU MONEY.

FRANK T. SUTHERLAND, M'g'r Pacific Coast Agency.

OFFICE AND WAREROOMS:

Care PARKE & LACY CO., ... 21 and 23 Fremont Street, San Francisco, Cal.

Or, Address the Company at its Denver Office.

The Russell Process.

For information concerning this process for the reduction of ores containing precious metals, and terms of license, apply to

THE RUSSELL PROCESS CO.,
Park City, Utah.

HEALD'S

Business College,

24 Post Street, - San Francisco.

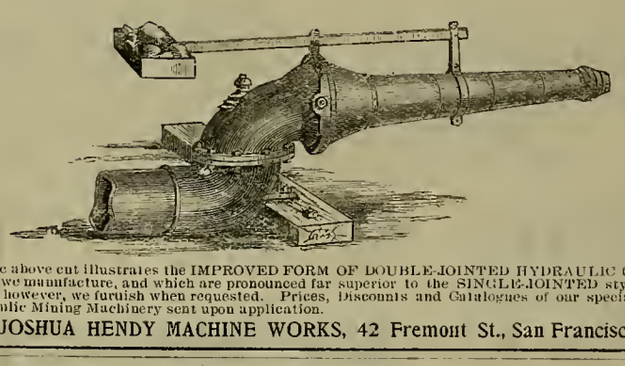
FOR SEVENTY-FIVE DOLLARS

This College instructs in Shorthand, Type-Writing Bookkeeping, Telegraphy, Penmanship, Drawing, all the English branches, and everything pertaining to business, for full six months. We have sixteen teachers and give individual instruction to all our pupils.

A Department of Electrical Engineering

Has been established under a thoroughly qualified instructor. The course is thoroughly practical. Send for Circular. C. S. HALEY, Sec.

IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

FRANCIS SMITH & CO.,

—MANUFACTURERS OF—

SHEET IRON & STEEL PIPE

FOR TOWN WATER WORKS.

Hydraulic, Irrigation and Power Plants, Well Pipe, Etc., all sizes.

130 BEALE STREET, SAN FRANCISCO, CAL.

Iron cut, punched and formed, for making pipe on ground where required. All kinds of Tools supplied for making Pipe. Estimates given when required. Are prepared for coating all sizes of Pipes with a composition of Coal Tar and Asphaltum.

The Gates Ore and Rock Breaker

Gives a finer product than any other crusher made, adding by this means 25 to 30% to the output of any mill, beside saving the wear of the more costly machinery. It will reduce a given amount of ore at one-third the cost in wear of any other crusher on the market. It requires also much less power for the same amount of work.

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Is now being adopted by the progressive Mining Companies in all parts of the world. More than 3000 of them now running.

The Pelton Water Wheel Company, General Western Agents

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Incorporated.

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BATTERY SCREENS AND WIRE CLOTH.

—AGENT FOR—

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MINE BELL SIGNALS.

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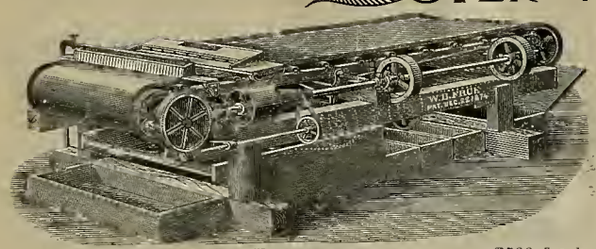
FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN LEGAL SIZE, 12 X 36 INCHES, THE MINE BELL SIGNALS AND RULES PROVIDED FOR IN the Voorhies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We can furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market Street, San Francisco, Cal.

FRUE ORE CONCENTRATOR.

OVER 4000 IN ACTUAL USE.

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; March 31, 1891.



Price of 4-foot wide Plain Frue Vanner ..... $500, f. o. b.
" " " Improved Belt Frue Vanner..... 600, f. o. b.
" 6-foot " Plain Belt Frue Vanner..... 600, f. o. b.

—o—

For any information, pamphlets, circulars or testimonials, call on or address

Jas. S. Brownell,
(Successor to ADAMS & CARTER,)
AGENT FOR THE
FRUE ORE CONCENTRATOR,
132 MARKET ST.,
San Francisco, Cal.

GLADSTONE MINING COMPANY, FRENCH GULCH. Shasta Co., Cal.
C. J. Clark, M. E., Gen'l, Supt. Dec. 12. 1891.

MESSRS. ADAMS & CARTER, San Francisco. Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $5 to $20 per ton and the tailing from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill.
C. J. CLARK, Gen'l Supt.

Cal. State Library

RISDON IRON WORKS.

Office and Works: Cor. Beale and Howard Sts., San Francisco.

Cable Address: "RISDON'S" San Francisco.

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MINING, MILLING, PUMPING and HOISTING PLANTS.

Steam Freighting Train.

ENGINE: 50-Horse Power.

CAPACITY OF TRAIN: 50 to 65 tons; depends upon the roads.

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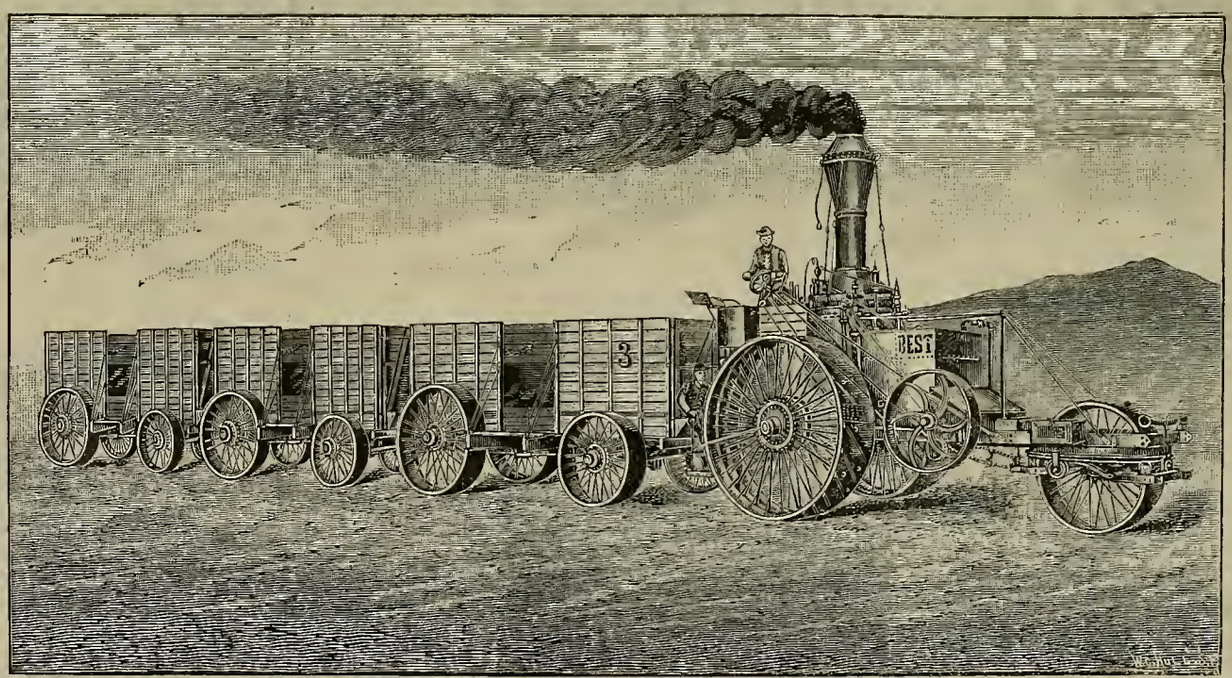


THE BEST MANUFACTURING CO., SAN LEANDRO, CAL., U. S A.

HAVE YOU A MINE? If so do not fail to see Parke & Lacy Co.'s Stock of MINING MACHINERY

SOLD AT LOW PRICES.

21 and 23 Fremont Street, - - - - - San Francisco, Cal.

MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 14. SAN FRANCISCO, SATURDAY, APRIL 6, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Cal State Library 1895

Arrastra—"The Poor Man's Mill."

Stamp mills and roller quartz mills, which were described and commented on at considerable length in last week's issue, have not wholly taken the place of a means of crushing quartz, crude but effective, still in use in some parts of this State. Reference is made to the arrastra—"the poor man's mill," which, as well as the Chilean mill, a development from it, are not extinct, as the accompanying illustrations show, being taken from direct photographs of arrastras now in operation in Kern county. As noted, one is worked by horse power, one by water power, and one by steam power, which in itself is considerable advance over the burro power of Old Mexico, and whilom of sections farther north.

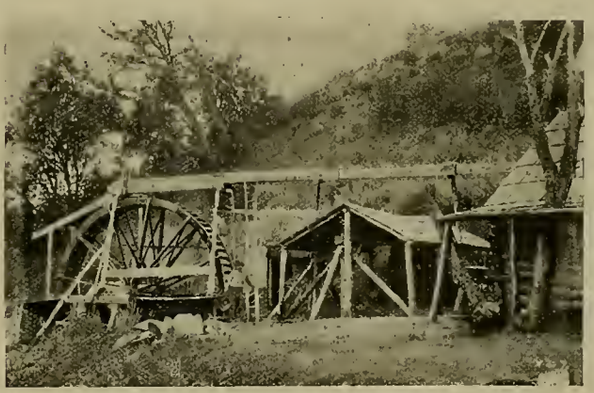
There isn't much said about arrastras, and where there is a big mine, or a mine not so big, but some capital, there needn't be, for an arrastra seems as slow and stupid as the donkey that drives it in its native place; but, primitive as the arrastra may seem and weakly productive in comparison to roller or stamp mill, it has an honorable though humble record, and has ground out many a dollar's worth of bullion in its simple old way. With all its rudeness, it deserves a word of praise. Unlike some mills, it never beats the company; the battery assays and car assays agree; the ore owners know that what goes in comes out, and there is no addition, division or silence. And with free gold it will hold its own with many a costly mill. It costs very little to set up; the running expenses are light; it rarely breaks down, and when it does can be cheaply and quickly fixed up; it needs little housing, watching or insurance; it can be built by the owner, who can be his own engineer, millman, foreman, amalgamator, feeder and boss, and the one man who combines all these positions can break the rock and keep the burro or the mule or the horse going all at once. Nothing blows up, and unless the mule gives out there isn't much prospect of loss; the amalgamation is usually satisfactory, and while there isn't much science nor style about the outfit there's considerable common sense and often lots of profit. It is not recommended as a superior article; it bears the same relation to better, faster, finer appliances for the same purposes that a country blacksmith shop does to the Union Iron Works, but "it beats nothing all to pieces," and in many an isolated mine would pay better to work ore than to have the owner sitting around "waiting for capital" to develop his claim, and thus work out his own salvation.

The arrastra is slow but sure. It is built in a primitive way, solidly and securely, its two greatest drawbacks being its limited capacity and liability to waste.

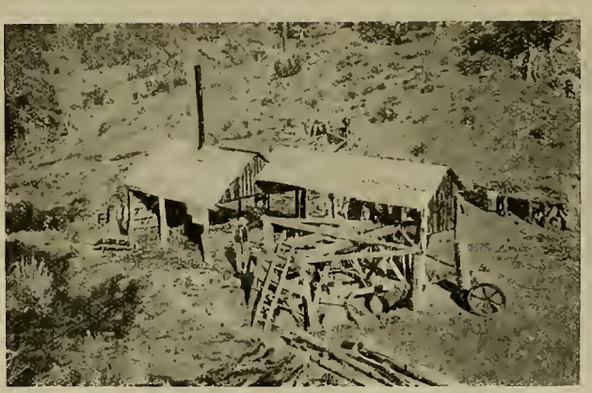
Judge Sumners' Kernville arrastras are in a granite country, much of it with feldspathic veins or dikes crossing, the arrastras occupying the site of a twenty-stamp mill built thirty years ago, but long since entirely removed, with the exception of the battery blocks.

The arrastras at Smartsville and Mooney Flat districts, Nevada Co., are twelve feet across and three feet deep. The bottoms are paved with hard, rough-dressed rock, laid evenly in cement and sixteen inches in depth. The center post is fourteen inches square, eighteen inches high, the post having four arms, to each of which is attached a heavy drag.

HORSE POWER ARRASTRA, KERN COUNTY.



WATER POWER ARRASTRA, KERN COUNTY.



STEAM POWER ARRASTRA, KERN COUNTY.

The drags are heavy diabase blocks clamped to the arms, so fixed as to cover all parts of the pit as they go round. Each block weighs from 700 to 1200 pounds. About seven tons of gravel are run in from a car or a chute, water being added to keep it from caking, and the arrastra run very slowly till the mass is of a "thin mush" consistency, when a speed of about fourteen revolutions a minute is attained (this arrastra ran by steam power). After an hour of this the gate is opened and the charge run into the 200-foot sluice containing the riffles, the sluice being cleaned up weekly. The result for cement or soft top gravel gave satisfaction, the cost of milling being eight cents per ton.

In the regular old-fashioned Mexican arrastra, run by a burro, the bed is built of paving stones laid on a puddled clay five inches deep, set closely, the joints tamped with clay; in the center a large-sized stone as a step for the "peon" or pivot, made of two pieces of timber 4x8 clamped together. A hole is bored in the bottom and a piece of round two-inch iron, worked off to a rounded point at the lower end, inserted. Through the peon at right angles are passed two pieces four-inch square, one extending horizontally seven feet six inches, to which the burro is hitched; to the other is attached the mullers or grinders. These are of rough stone, prismoidal in shape, thirty-six inches long and about fifteen inches wide, so dressed as to throw the center of gravity well toward the base. At the upper end of each stone's front face two six-inch plug holes are drilled, in which are fitted plugs of dry sugar pine, which, when wet, swell and are immovable. The outside edge of one stone works a little in advance of the inside edge, thus throwing the charge toward the center. Of course, in setting the other stone, this arrangement is reversed.

The upper end of the peon is fixed in a four-inch pinion, which works in a bearing collar made of wood 2x8 inches; the collar is mortised near each end 1x3 inches, corresponding holes being made in the other timber and the two secured by a wooden link and pins. With such an arrastra a 600-pound charge is usual and the patient "mauana" worker gets enough to satisfy his needs, his chief lookout being to see that no grease gets near his machine.

The Chilean mill is sometimes associated with the idea of the arrastra, from which it may be considered to have been developed. It is to all intents and purposes a millstone set on edge and so arranged that it will revolve in a circular track, the axle upon which it revolves being pivoted at one end, the mule hitched to the other. As an expedient in out-of-the-way places the Chilean mill and the arrastra both serve a purpose, the Chilean mill reducing the assorted spalled ore to pea size, thence to the arrastra, where about one-half the charge is first placed and thoroughly moistened as the peon revolves, about two and one-half ounces of quicksilver being added as the grinding progresses, and the remainder of the charge is put in. From twelve to sixty hours is the limit for grinding, which depends on the nature of the ore and coarseness or fineness of the gold, amalgamation in the case of coarse gold being sometimes reached in twelve hours and in the case of fine gold requiring even more than sixty hours. The accompanying apparatus for settling, retorting, etc., is necessarily rude but in most cases effective. In this brief notice of a primitive gold producer no attempt is made to give the detail of setting up or working, the subject being treated in outline in the most general way.

MINING AND SCIENTIFIC PRESS.

ESTABLISHED 1860.

Oldest Mining Journal on the American Continent.

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Our latest forms go to press on Thursday evening.

J. F. HALLORAN.....General Manager

San Francisco, April 6, 1895.

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DEVELOPMENTS in the Carson mint shortage indicate that the New York bond syndicate are not the only ones who can play a hunco game on Uncle Sam.

SENATOR STEWART of Nevada writes a long letter advocating the organization of "a gold party" and "a silver party" for presidential nominations next year. He can always be counted on to advocate anything that is combative but impractical.

SLOWLY but steadily the hydraulic mining industry of the State is building up again. Three more permits were issued by the Debris Commission this week, making about 75 since that body began its work. With all available hydraulic mines in operation the million a month now yielded from California gold mines would be nearly doubled. Including individual as well as corporate owners it is estimated that there are nearly 150 paying quartz mines now being operated in this State.

THE Governor of Nevada has vetoed a mining bill passed by the recent Nevada State Legislature. It defined a quartz claim as being 1500 feet long by 600 feet wide, and prescribed that in locating a placer claim its dimensions should be those of a quartz claim, "except that where the word 'feet' occurred in such designation it should read 'acres.'" As a placer claim 1500 acres long by 600 acres wide would bring the locator in collision with the federal statutes, and be awkward in other important respects, it is believed the Governor did right in vetoing the bill.

THE long litigation between the English and American claimants of the Amador gold mine, at Jackson, Cal., is at last ended, the ruling and decision of Judge Davis having been sustained by Judge Daingerfield, resulting in dispossession of the American claimants and a writ of possession given J. E. Dye, the financial agent of the English claimants. That being settled the next thing in order is to go to work and develop the idle mine, which has been proved to be a very valuable property. The costly litigation alone evinces that fact.

OF many men and measures it has been said: "The stars in their courses fight for them." According to a grave contemporary, which rarely jokes, the stars favor silver. It says:

> It is a very singular fact that the stars have an indirect effect on the price of silver. The present speculation in silver in India, which is entirely in the hands of native dealers, is chiefly regulated, it appears, by the astrologers, who direct their clients when to buy for a rise and when to anticipate a fall. Of course, in many cases, the fact that their clients follow the advice given them brings about some fulfillment of the prediction, which redounds to the credit of the prophets. Some recent heavy speculative purchasers of silver in London have passed on this kind of advice, and it is said also that the failure of last month's fall in exchange to bring out gold on the Indian bazaars was due to a similar cause.

It probable, however, that the sidereal aspect of the matter is subsidiary to the coarser law of supply and demand.

The Mineral Lands.

The act of July 1, 1862, and July 2, 1864, which donated nearly 100,000,000 acres to railroad corporations, gave the coal and iron land within their limits, but excepted all other mineral lands from the grants. The question of what is mineral land and what agricultural has long been one of argument and litigation. Last year the U. S. Supreme Court, in the case of Borden vs. the Northern Pacific Railroad Co., held that the Secretary of the Interior may determine what is mineral and what agricultural in railroad land up to the time patent issues to the railroad company; but after patent once issues, the matter has passed beyond his jurisdiction and is settled. In accordance with that decision, Secretary Smith issued a general circular referring to railroad selections within mineral regions, providing that wherever a list of railroad selections covered lands located within six miles of any mineral entry, claim or location, publication should be made for sixty days, calling for any claimant to protest against such selection, and in the absence of such protest the land in question was to be adjudged agricultural and a patent issue to the railroad company for such list.

So far as known, the MINING AND SCIENTIFIC PRESS was the first paper to publish this circular or direct attention to its importance, and the danger to any owners of unpatented claims within the regions affected by it; and urgent representation was also made to the miners of California of the need of either securing patents to their claims, and thus forever settling their legal right to the ground claimed, or else to find the exact location of their claims with reference to legal subdivisions and take care to see the railroad company's advertisements when they appeared, and, if their claims were included in the published list, to enter protest at the Land Office. It was also pointed out in these columns that the indirect idea on the part of the Government was evidently to compel miners to perfect their title by securing a U. S. patent, which, where practicable, is the best way.

When the Cal. Miners' Association held their annual convention in November, this matter was brought to their notice and received the fullest attention, none too soon, for already in several parts of the State the railroad company was publishing its lists, lumping whole areas of tens of thousands of acres in a little brief, solidly-set designation by townships without subdivision or any other designation, mostly in some obscure paper, the whole thing taking up only two inches or so among other advertisements, and cleverly designed to attract no attention. The convention appointed a committee consisting of Tirey L. Ford, E. A. Belcher and Chas. G. Yale, who made an elaborate and exhaustive report, being a complete argument from the standpoint of the miner, and which, through these columns, was given wide circulation. When the report was read, it was made the subject of several speeches, and the result was the appointment of a committee on mineral lands whose business it was made to check the action of the railway company till the miners' side of the case could be presented, and permanently prevent the acquisition by railroad companies in this State of unpatented mineral lands within land grant and indemnity land grant limits, it being made the duty of the committee "to appear before the Department of the Interior by memorial and by agent, to endeavor to stop the patenting of mineral lands to subsidized railroads: also to obtain an order from the Commissioner of the General Land Office that the burden of proof that land claimed as agricultural by the railroads shall be placed on those corporations, in accordance with the decision of Justice Field in the Borden case" in Montana. The magnitude of the matter was unusual—the total amount of the S. P. grant alone in this State being 1,638,000 acres—the committee at once began its work, invoked Congressional aid, sent a representative to Washington to secure information, who met with considerable opposition in some unexpected quarters, notably the office of the Commissioner of the General Land Office, whose subordinates seemed to think they were employed solely by the railroad company till they were shown otherwise.

Nearly every newspaper in the State published in a mining community copied the articles from the MINING AND SCIENTIFIC PRESS, the city dailies took the matter up, the committee worked unremittingly, and a degree of publicity was given that was fatal to the secret scheme for success relied upon by the corporation that was trying to absorb so much of the public domain. The committee issued an appeal for pecuniary help that was responded to from many parts of the State, though not as widely nor as freely as was hoped from the 13,000 miners of the State, every one on the committee working without pay; and as fast as the location of the lands could be ascertained, specified protests against the issuance of patent were forwarded to Washington accompanied by such statement of facts and figures as made out a strong case for the miner. With one exception, the entire California Congressional delegation aided materially in this case of the commonwealth vs. the corporation and helped in the securing an order from the Secretary of the Interior postponing issuance of patent for "clear list 54" pending publication, which is now being made in the Monday issue of the Sacramento *Record-Union*. This list shows that in evident defiance of all the legal requirements, mineral land, which by the express provisions of the law was exempted, is included, the railroad selections taking in some of the oldest mining towns and the best known and longest located gold claims, it being solemnly averred that a section of "the Mother Lode;" such towns as Kelsey, Gold Hill, Union Town, Forest Hill, Gold Run, Towles, Colfax; such mines as the Mayflower and West Damascus; such streams as Deer creek, Wolf creek, North and South Forks of the American river, Otter and Canyon creeks; such peaks as McKinstry's and Lola; such lakes as Eureka and Meadow lake," are all—according to "clear list 54"—"agricultural land."

Following the order for the publication of this list came withdrawal of list 22 in the Los Angeles district and list 25 in the Redding and Marysville districts, and a general suspension of Government haste in the matter showed that the Commissioner of the General Land Office was not the sole arbiter in the matter as he assumed to be at the outset when he refused access to public records in his office.

A similar effort to absorb fifteen townships in Trinity, Sbasta and Siskiyou Cos., by technical compliance with the letter of the law in inserting a brief notice in the Scott's Valley *News*, was also discovered and ventilated, and so far the effort has been checked. Miners in various counties have also been active in making individual protests at the Land Offices, in addition to the general protests on the part of the committee, and such general vigilance exercised as to bring to a standstill the governmental railroad machinery that was so rapidly placing the land in question in such shape that miners and prospectors would have to acquire title to that part of the public domain from the railroad company.

In all this there has been no petty hostility or effort at annoyance or desire to withhold any one's just right. It is recognized that the railroad company have certain rights to certain lands; in these rights the company deserves and should have the same exercise of justice as any other citizens; no more, no less; all the miners ask is that their rights be not interfered with, and being crowded pretty close, they are making a determined fight. Sometimes peace is so valuable that men must fight for peace. So in the present instance. There isn't a miner in the State who wants to see the S. P. Co., or the C. P. Co., or any other company, railroad or otherwise, beat out of an acre rightfully theirs; but in assuming that mineral land is "agricultural land," and trying to grab mining claims and mining towns, the corporation has evoked a spirit of determined resistance that asks only for justice; for what is right and lawful; and that has no apology to make for being right, but says "Hands off, or take the consequences." It is to be noted that several thousand acres in this State, avowedly mineral land, has been held by the railroad company under agricultural patents, and that the miner has been compelled to secure title to such land from the railroad people, this, as other things, in contravention to anything contemplated by law.

From the start, the MINING AND SCIENTIFIC PRESS has also directed attention to one fact which at any stage of the conflict, or in the absence of any conflict, should not be overlooked—for every reason it

is well if at all practicable for every miner or claim owner to get a U. S. patent for it; then if he wants to hold it, no man or men can bother him; and if he wants to sell it, nothing, not even the value of the gold in it, will help the sale so much as to be able to say, "I have a U. S. patent for this." Mine buyers like nothing better than a clear title: they dread nothing so much as a lawsuit.

Meanwhile, to return to the subject, the work goes on. The executive committee of the California Miners' Association met last Tuesday night and decided to send A. H. Ricketts, the chairman of the mineral land committee, to Washington to personally see the President of the United States, the Secretary of the Interior, the Commissioner of the General Land Office, and make such showing as will be fully explanatory of the justice of the position assumed by the miners of California and endeavor to secure suspension of all proceedings in patenting public lands within railroad grant limits in this State till Congress meets next December and can take action on the classification bill introduced in the closing weeks of the 53rd Congress. Mr. Ricketts leaves next Tuesday and will be absent several weeks.

MR. HENRY T. SCOTT, of the Union Iron Works, president of the Manufacturers' Association, in an interview in last Tuesday's *Examiner*, says some things that are strictly business and strictly true. For instance: "We should cultivate the Chicago spirit—the spirit that fills the people of that city with the belief that anything made in Chicago is better than the same thing made anywhere else. It has been the habit here to believe that nothing could be really good unless it were made at a long distance from our homes." Mr. Scott characterizes it as a "habit." That's just what it is. That habit pervades all our people, urban and rural, and not till its tendency is more clearly realized will the business pendulum start to swing the other way.

IN happy contrast to the whimpering pessimism of some publications, the *Engineering Magazine*, in its current number, devotes a page of its advertising space to a sworn statement of its business, signed by its manager, in which it appears that in the month from January 10th to February 10th, '95, there were received 952 new regular cash-paying subscribers, and that, in addition to all current renewals and transient orders for advertising, there were received during January advertising contracts aggregating $2888. The statement has every appearance of truth, and is a good index to improved conditions in the industrial world, in many branches of which the *Engineering Magazine* is an able exponent and impartial review.

REGARDING the enormous demand for mining machinery in South Africa, a Johannesburg correspondent of *Machinery* (published in London) estimates that within a short time 1000 additional stamps "of heavy and improved type" will be working. In some of the deeper mines the number of stamps required is estimated as follows: Geldenhuis 200 stamps, Nourse 150, Crown 250, Langlaagte 250, Rose 150, Robinson 150, Village Main Reef 100 and Simmer and Jack 250.

THE Sacramento *Record-Union* sensibly and justly opposes what is usually known as a "write-up." The "write-up" was done to death years ago, and is valueless. Its appearance is detrimental to whatever is "written-up," and the money paid is worse than wasted. The paid "write-up" should go with the "coupon," "premiums," and other journalistic attachments.

J. S. LEEDS, manager of the Traffic Association of San Francisco, has resigned his $10,000 position, saying that it no longer has need of his services, and returns to his home near Cincinnati, O.

HON. JAMES G. GRANT, formerly Governor of Colorado, and now one of its foremost mining and smelting men, has been selected as chairman of the Exposition of Mining at Denver in 1896.

A NEW coal mine has been discovered within seven miles of San Bernardino. The vein is twenty inches wide and runs for miles. A company is forming to open up the find.

Concentrates.

NEVADA people fear that the Carson shortage may shut down the mint.

THE Horn Silver, Utah, mine paid a 12½-cent quarterly dividend last Monday.

THE Blue Bells, during the past 90 days, has shipped 8000 tons of ore to the Pilot Bay smelter. Besides silver it is said to carry 1¼ per cent in nickel.

THE Blue Mountain Mining Company has incorporated at Haines, Oregon. Capital stock, $200,000; incorporators, D. Wilcox, G. H. Taney, C. F. Hill.

THE *Ledger* asserts that S. W. Bright has arranged the sale of the Bellwether mine in Jackson district, Amador Co., to New York capitalists for $110,000.

BY an adverse majority of 59, Grass Valley citizens decided last Tuesday that they did not want to bond the city for $50,000 for forty years to build sewers.

THE action of Samuel W. Allerton, of Chicago, against the Homestead Mining Company, in South Dakota, to recover $200,000, has been dismissed.

A PETITION has been filed by the stockholders of the Linderaxa Mining Company for the removal of the principal place of business from Mokelumne Hill to Berkeley.

THE Debris Commission last Monday granted hydraulic permits to the Mooney placer mine, the Black Lock mine, near Placerville, and the Grizzly Flat mine in El Dorado county.

MRS. PRICE'S interest in the Colorado mine, Minas Prietas, Mexico, is reported sold to the Chamberlin interest for two million dollars, and J. N. Jones will be manager of the property.

AT Pilot Bay the smelter is shipping a carload of bullion a day. The ore treated is chiefly from the Bluebell mine on the shores of Kootenai lake. Thirty-five men are at work in the mine.

THE Apex-Albambra Mining Company has incorporated at Salt Lake with capital stock $27,000. The company owns the Apex, King Solomon and Alhambra mining claims in Millard county.

THE Nevada *Herald* learns that the Badger Hill Mining Co. are negotiating the sale of their property to Grass Valleyans. The mine is looking well, and is considered a valuable property.

PROFESSOR BLIVENS of Okanogan, Wash., says that his new process is now entirely covered by caveats and patents, and that it will be impossible for any one to infringe on his valuable rights.

LEIGH HARNETT, who has been investigating the mineral resources of Josephine county, Oregon, says there are between sixty and seventy placer mines in full operation there, with more to be opened soon.

THE Mariposa Power and Mining Company has incorporated. Directors—W. B. Lee, F. E. Hentrich, P. T. M. Wate, G. E. French and J. M. Duncan. Capital stock, $200,000, of which $500 has been subscribed.

ALFRED L. WEST fell from a skip in the shaft at the Golden Gate mine in Sonora, at the 300 level, last Tuesday, and was instantly killed. His body was found between the 400 and 500 levels, his head being crushed to a jelly.

THE brick vault at the Nevada Reduction Works, near Reno, in which quicksilver and other articles were stored, was recently entered by burglars, who stole twelve flasks of quicksilver, containing about seventy-six pounds each.

COOK & BRUEN, of Denver, have bought one-half the Yankee Fork, Idaho, mine, and expect to treat the ore at a cost of milling not to exceed $2.50 per ton. A twenty-stamp mill will be built and considerable other machinery put in.

THE Interior Development Company, which lately purchased the property of the Amador & Sacramento Canal Co., are preparing to reopen the old Sebastopol mining ditch. Two thousand feet of twenty-inch pipe is to be laid across Arkansas creek.

SENATOR TELLER, of Colorado, is quite proud of a new paper weight which has been given to him. It is a block of standard fine silver, inscribed "Sixteen ounces Colorado silver," upon which is fixed a block of gold, inscribed "An ounce Arizona gold."

R. W. GRAYSON has filed a protest against the publication of lists of proposed railroad land grants clear listed in the Redding and Los Angeles land offices, showing that the publication of the lists was not in conformity with the requirements of the department.

C. B. HOFFMAN, of Montana, is either a very lucky or a very unlucky man. Last spring his clothes were torn off of him by lightning, at the Glengarry mine. Last Wednesday he fell thirty-five feet down the Glengarry shaft and came up unhurt except a few scalp wounds.

THE *Mining Review* says that the case of the Rico-Aspen vs. the Enterprise has not been finally decided, but that the effect of the recent St. Louis ruling was simply to remand it back from the U. S. Court of Appeals to the original court for further hearing upon questions of fact.

GOV. JONES, of Nevada, has vetoed Assembly bill 95, relating to the locating, recording and working of mines, on the ground that its provisions in making new and unusual requirements for locating lodo and placer claims are inconsistent with the mining laws of the United States.

THE English quartz mine, near Cherokee, Nevada Co., was bonded last Tuesday to John M. and Fred J. Thomas, of Grass Valley. A mill is to be put up and 300 feet of new flume will be built. The purchasers intend to work the mine thoroughly and will put on as large a force as possible.

THE cement crushing mill at the Kate Hays mine, French Corral, is to be moved to Badger Hill, near Cherokee, says the Nevada *Transcript*, where it will be put up and used to crush the gravel and cement found in the Milton Company's claim at that place. The mill will be erected on the old Badger Hill claim.

AN investigation of the practical value in gold production of the black sand existing along the coast of Washington and Oregon is to be made at North Head, Wash., just north of the Columbia river, under the direction of David T. Day, chief of the division of mining statistics and technology of the United States geological survey.

"AFTER a fruitless effort to make their scheme a success the gold miners at the Ocean House beach have suspended operations. The dust extracted from the black sand does not pay more than fifteen cents per ton, according to their calculations. The machines used for amalgamating purposes at the scene of operations have all stopped running, as the best of them cannot clear more than ninety cents per day." The above, from a daily paper, is the latest from the annual bonanza discovered in that vicinity.

DIRECTOR WOLCOTT, of the U. S. Geological Survey, proposes to place Drs. Becker and Dall in charge of an investigation of the coal and gold resources of Alaska. They will leave Washington next month, go to Sitka via this city, thence to Kadik, Cook's Inlet and Unga Island, returning about August 1st.

THE Gertrude Gold Mining Company incorporated at Spokane, Wash., is capitalized at half a million dollars: purpose to own and operate mining properties in the United States and British Columbia, together with mills, smelters, concentrators, etc. The trustees are C. P. Oudin, A. Beamer, A. B. Railton, F. D. Gibbs and F. W. Gibbs.

A MAN named David Crisman was found in an abandoned tunnel, near Winnemucca, Nevada, last Sunday, nearly dead from starvation. He claimed to have been in the tunnel a month without food, and nothing but snow water to drink. When taken to Winnemucca and placed in the hospital, he had wasted away to skin and bones, and it was doubtful whether he would live.

CAPTAIN PARKER believes that the plan which he originated some time since, of dredging the rivers and bays of Coos county for deposits of gold-bearing black sand, is feasible. While on Coos bay he informed the *News* that he will visit that place in the near future. He has perfected a machine which will handle 2000 tons of sand per day with a working force of only three men.

THE new DeLamar, Nevada, mill started up last Tuesday. A 100-horse power electric hoisting plant has been ordered by Captain DeLamar for the DeLamar Company. The cars in the tunnels will also be operated by electric power. About 300 feet east of the mill a tunnel has been started to tap the mines of the DeLamar Company, at a greater depth than any of the present workings.

LEAVING out the islands, the central point of the North American continent is in longitude 116 deg. 17 min. West, and latitude 40 deg. 30 min., or in the neighborhood of Elko, Elko county, Nevada. Including all Uncle Sam's dominions, the central point between Eastport, Maine, and Attou, Alaska, would be in the Pacific ocean, about 34 miles due west of the mouth of the Columbia river.

W. T. HART, a Montana representative of capitalists, has bonded property in the Slate Creek, Wash., district covering several groups of mines, for an amount aggregating $500,000. Forty men went to work developing the property last week. Thirteen tons of steel tools form part of the outfit. The men will have hard sledding for a while, as there was fifteen feet feet of snow on the claims a month ago.

THE contract for the construction of the Parrot Mining Company's ditch has been let by the Parrot Company to Winters, Parsons & Boomer of Butte, Montana. The ditch will be 18 miles in length, from 15 to 30 feet wide and 5 feet deep. It is for the purpose of conveying water from the Jefferson river to the site of the new smelter to be erected by the Parrot Company five miles from Whitehall in a few months.

THE Baker City, Or., *Democrat* says most of the old miners around there who have been holding onto their properties for years expecting to become millionaires seem to have come to the conclusion that to bond some of their prospects and have them developed would be a pretty good idea. There are too many mines lying idle these days on account of their being held and owned by parties who expect to make sales and make money without working for it.

SAM'L MCINTYRE, in his report to the directors of the Mammoth Mining Co., of Utah, charges some of the officers of the company with complicity in an alleged over-disbursement of $127,521.20. He says $84,888.15 more than was necessary was spent for the new mill, and that nearly $80,000 was lost in the treatment of ores. The officers censured say that his figures are made up almost wholly from erroneous estimates and that his allegations have no foundation in fact.

THE Supreme Court has decided the case of Alvord et al vs. the Spring Valley G. M. Co., reversing the decision of the lower court from which appeal was taken. The gravel mine at Cherokee, Butte Co., was the property in dispute. When the bondholders started to foreclose the mortgage given in '81, other creditors of the mine—the Bank of California, N. D. Rideout and C. Waldeyer—intervened, claiming that the mortgage was illegal, not having been authorized by two-thirds of the stockholders of the then New York corporation. Judge Prewett in the Superior Court decided that such view was correct; that the mortgage was not technically flawless. The Supreme Court now reverses that decision and sustains the legality of the bond issue, and the execution of the mortgage.

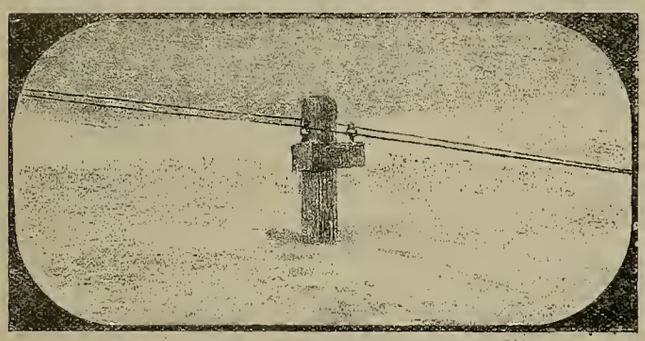
MONTANA prospectors who locate claims after July 1st in that State should remember that to make a new quartz location after that date the prospector must sink a hole at least ten feet deep to solid formation, must have at least one well-defined wall, and the stakes must be placed so they can be found. Under the new law the notice of location cannot be placed on a stump or a tree adjacent to the claim, but must be posted in a conspicuous place at the discovery shaft. He is allowed ninety days to sink the required depth and record the claim. If an old claim is relocated, he is required to sink it at least ten feet deeper than when he first found it, and stake and relocate it as though it was an original discovery. If he runs a tunnel it must be at least ten feet long, so as to determine the fact that a vein supposed to carry precious metals has been discovered.

AT a meeting of the Executive Commitee of the California Miners' Association last Tuesday evening in this city, the San Francisco Board of Trade handed in its check for $1000 as its first contribution to aid in protecting the mining interests of the State. A resolution was adopted looking to the appointment of an agent at each mining town in the State to issue certificates of membership on the payment of $5. A motion was adopted that an assessment be levied on the county associations equivalent to fifty cents a member, the amounts already contributed to be credited thereon. The sum of $2000 was voted for the expenses of Mr. Ricketts' trip to Washington. It was ordered that a financial statement be prepared, showing receipts and disbursements of the association to date. Mr. A. H. Ricketts was appointed to proceed to Washington, visit the heads of departments, the President and others, and make such a showing of the facts in the case as would aid in preserving the mineral lands of the State from absorption by railroad corporations.

Electric Power Transmission.

(Concluded from last issue.)

The line has given no trouble whatsoever, and has carried the high potential of 3000 volts without a leak, even during a severe storm of ten hours' duration, the rain changing to sleet and ice toward the end; but the severe test, it must be admitted, occurred after the wire had been wrapped at the insulators as described. In fact, one of the chief objects of this insulation was to render the line proof against just such a storm as this. Snow-storms have no effect whatever, as will be observed by reference to the illustration "Pole No. 40."

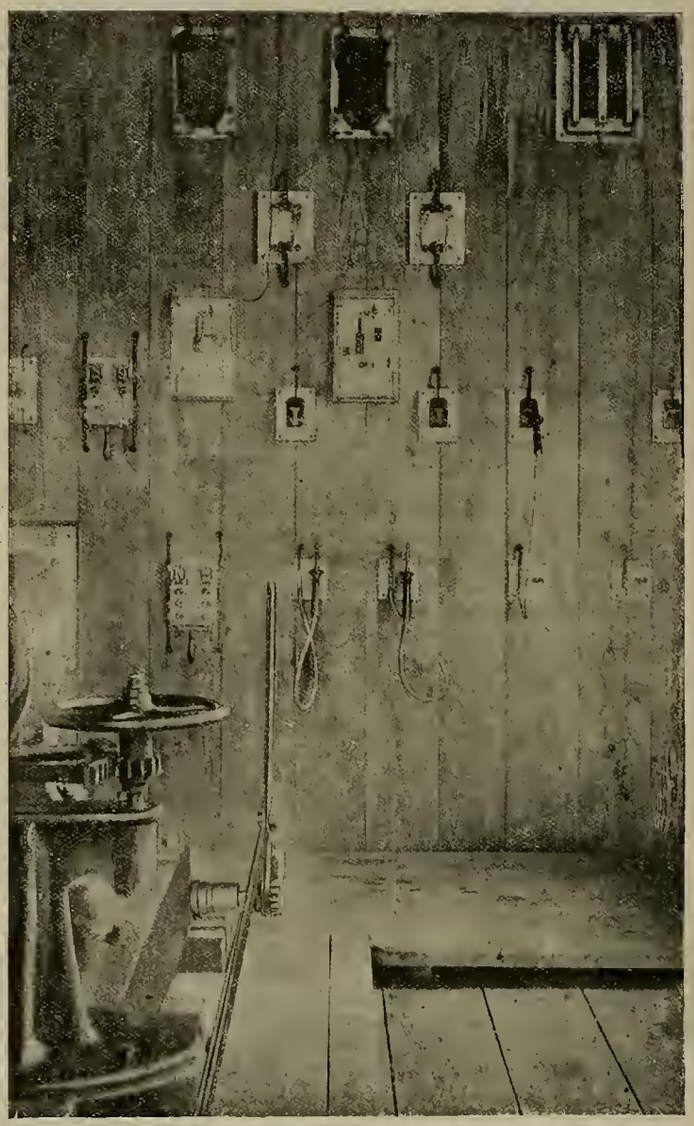


POLE NO. 40: 4000 FEET FROM MILL.
(Wire is 17 ft. above ground at pole; snow 15 ft. deep.)

The motor that drives the stamp mill of the Standard Consolidated Mining Company at Bodie is an A. C. synchronous constant-potential machine of 120-horse power, illustrated below in operation. The mill contains twenty 750-pound stamps, four wide-belt (6-ft.) Frue vanners, eight continuous-process amalgamating pans (two of which are constantly grinding), three settlers, one agitator, one pan and settler devoted to the amalgamation of concentrates, a bucket elevator, a worm-gear hoist, and a rock-crusher. In order to determine accurately the capacity of motor required, a number of cards were taken with the Tabor indicator from the 20 by 36-inch steam engine that drove the mill, showing an average of 90 and a maximum of 101½-horse power.

The fields of the motor are self-exciting through a secondary winding on the teeth of the armature, the current being led to a twelve-bar commutator similar to that on the generator. In fact, the motor is almost identical with the generator, the chief difference being in the compensating-winding on the field-bobbins of the latter.

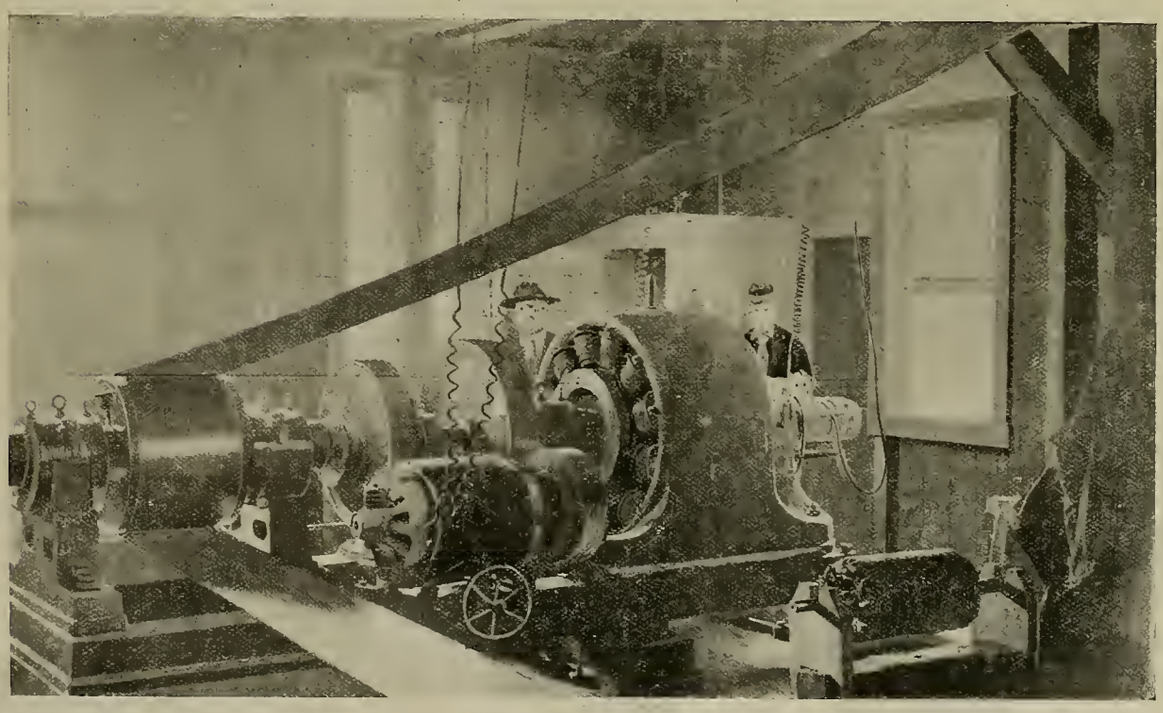
On the armature shaft of the motor is a friction-wheel, and beyond this a clutch, which is used to set in motion the driving-pulley and the machinery of the mill. On the same bed-plate with the motor is a small 10-horse power Tesla starting-motor, with a wooden pulley on its shaft, that is brought to bear against the friction-wheel mentioned, by means of a screw and hand-wheel. This Tesla motor consists simply of field-coils and an armature; it has neither brushes, nor commutator, nor sliding contacts of any kind. The alternating current is led directly into the fields, the stationary element, the coils of which, being connected in series, produce a rotating magnetic field, in which each pole is alternately positive and negative. The starting-torque of the armature is, in consequence, very low, and it has to receive several rapid turns by hand before putting on the current, after which it generally runs up to normal speed (1660 revolutions) within a minute. In the switch-board, as shown herewith, the two plugs in the sockets on the right of the board are the line-plugs, and the two to the left of them, in their rests, are the starting-motor plugs. When the line-plugs are in their sockets the current is led directly to the top of the upper jaw-switch, and this switch is never closed until the machines are in synchronism. The wires from the bottom of this switch lead directly to the collector-rings on the armature-shaft of the motor.



MOTOR SWITCH-BOARD.

In the upper right-hand of the board is the Wurts lightning-arrester, consisting of 22 spools, 11 on a side, separated each by a distance of $\frac{1}{32}$ inch. Both legs of the wire-line are attached to the arrester, one on each side at the top, while the ground-wire leads from the bottom spools to a water pipe in the earth. The spools are made of a patent non-arcing metal, and the dynamo current will therefore not follow the path through them made by a discharge of high-tension atmospheric electricity. The properties of this alloy are such that oxides of the metals are generated by the passage of lightning and not vapor of the metal itself.

To the left of this instrument are two converters of the ratio of 30 to one, filled with paraffine oil. The primary coil of the right-hand one is connected to the main line just above the plug-sockets, and that of the left-hand converter is connected to the motor-circuit, *i. e.*, the wires reading from the collector-rings on the armature-shaft to the bottom of the upper jaw-switch; it being understood that the motor acts as a generator when being driven by the starting-motor. To start the motor requires two men, one to handle the starting-motor and the other at the switch-board. The line-plugs are put in, which leads the main current to the top of the synchronizing-switch, and the lower jaw-switch is thrown in, which closes the field-circuit of the motor, and the secondary of the main-line or generator converter, thereby lighting the upper lamp of the synchronizer. The armature of the starting-motor is turned a few times by hand, and the two left-hand plugs are then pushed into their sockets, leading the current from the main line to the fields of this motor.



MOTOR IN OPERATION, STANDARD CONS. MILL.

As soon as the armature is above speed, about two-thirds of the rheostat is thrown out, permitting 40 or 50 amperes of current to flow, and the lower lamp of the synchronizer to burn. The pushing onto its button of the little switch on the bottom of the synchronizer now connects the two central lamps in series with the motor and generator currents, and they begin to flash in accordance with the phases, and therefore the speeds, of the two machines. As the speed of the motor approaches that of the generator, the wave-phases come nearer coincidence, and these lamps brighten and darken almost simultaneously.

The attendant stands with one hand on the rheostat and the other on the open jaw-switch, watching these waves of light intently, and just as the two lamps darken in unison, he throws in the switch and pulls one of the starting-motor plugs. The lamps only remain

"out" for a second or less, while the speeds are together, and then flash up brightly again as the motor speed drops off: there is therefore but a fraction of a second during which the jaw-switch should be closed, though the time can be lengthened slightly by a proper handling of the starting-motor.

If this switch has been thrown in at the right moment, the series lights remain "out," while the top and bottom, or "pilot" lights, burn brightly, and so continue all the while the machines are in operation.

The entire operation of starting up the motor from a state of rest occupies from three to five minutes, and when once in synchronism, the clutch can be thrown in and the mill shafting brought to normal speed in from one to two minutes more, after which the load may be thrown on as fast as desired without the least danger of pulling the motor out of synchronism. The clutch is always thrown in slowly in order to prevent too heavy a flow of current, and consequent sparking of the commutator brushes.

By means of a single counter-shaft, fitted with self-oiling boxes, the high speed of the motor, 860 revolutions, is reduced to the necessary 80 revolutions of the battery line-shaft, the reductions being 2 ft. to 8 ft., and 3 ft. to 8 ft. Light steel-rim balanced pulleys are used, and an endless 16-in. double leather belt runs from the motor to the first 8-ft. pulley. The speed of this belt is 5400 ft. per minute, and it is kept tight by levers which, acting through screws, move the entire motor and its bed-plate along four grooved, cast-iron slides.

The motor is separated from the underlying brick foundation by means of 8 by 10-in. timbers, which are bolted to the latter and covered by three layers of 1-in. boards; and to this wood insulation the slides referred to are fastened by lag-screws that pass through the boards into the timbers. The generator is insulated from the I-beams that carry both it and the water wheels, by timbers 5½ in. thick, to which it is likewise secured by lag-screws.

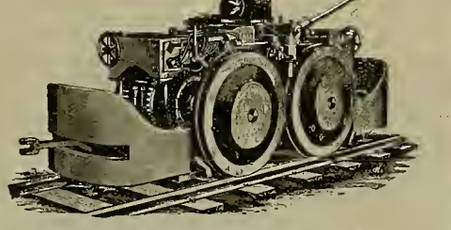
The mill and offices of the company are lit by 100-volt incandescent lamps, taking current from a large 100-light converter, ratio 30 to 1, which is attached to the main line in the motor-room, before it reaches the switch-board. The light is very satisfactory, even to read or write by, although at times the lamps flicker slightly, due to changes of load.

The entire cost of this plant did not exceed $40,000. Its operation during the month of October, 1893, alone effected a saving of $2100, equivalent to $1.46 per ton of ore crushed, and reducing the total milling cost to $2.32 per ton; a fairly low figure for a high-priced camp (wages $4 per day) such as Bodie.

The plant runs smoothly, and demonstrates the effectiveness and simplicity of the single-phase synchronous system for such work and distances, while the daily saving over the use of steam, on twelve-hour runs, is from $35 to $40.

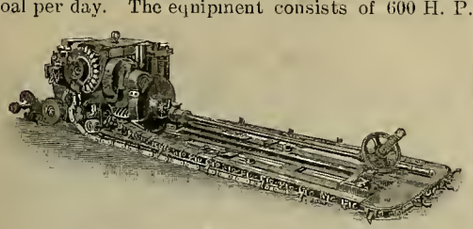
A Mammoth Coal-Mining Plant.

As a matter of indirect interest to this coast it is noted that the Essen Coal Co., of Pittsburg, have just closed a contract for a complete electric plant for mining and hauling the coal in their No. 2 and No. 3



80 H. P. ELECTRIC LOCOMOTIVE.

mines at Hazeltine, Pa., being the largest plant ever considered for bituminous mines. It will cost $80,000, and is intended to produce 2400 tons of mine run coal per day. The equipment consists of 600 H. P.



CHAIN BREAST MACHINE.

in boilers, three 200 H. P. engines, three 150 K. W. dynamos, two 80 H. P. locomotives, station equipment and circuits, and sixteen chain breast machines. The electric locomotives and breast machines are herewith illustrated.

EXPORTS of mineral oils from the United States for February were 60,639,199 gallons of a value of $3,161,396, against 55,803,469 gallons of a value of $2,646,019 for the same month last year.

Characteristic Features of California Gold-Quartz Veins.

NUMBER II.

Read before the Geological Society of America by WALDEMAR LINDGREN, December 29, 1894.

The typical gold-quartz veins cannot be considered as anything but fissures and fractures filled with quartz, accompanied by small amounts of native gold and metallic sulphides. Replacement proper of the minerals of the country rock along the fissure by quartz I have never been able to observe, and causes supposed to be of such nature have always proved to be due to the shattering of the country rock and the filling of it by silica along narrow cracks. The clean quartz usually forming the vein I cannot account for in any other way than by filling of cavities, as it does not seem possible that a replacement of the ferro-magnesian silicates and other minerals could occur without leaving chloritic stains or other signs in the resulting mass. In all quartz veins of this type it seems unavoidable to admit the existence of open spaces along the vein, supported at frequent intervals by the contact of the two walls or by rock fragments. Even the heaviest veins show in the underground workings frequent places where the walls "shut down." Such fillings of clean quartz may vary in width from a few inches to several feet. "Horses," of course, frequently appear in the larger veins, separating them in two or more parts. The heaviest veins appear to be found along the mother lode in Tuolumne and Mariposa counties, where the clean quartz often reaches a width of ten to fifteen feet, and in isolated cases even more. This extreme thickness seldom continues for any great distance. It may probably be safely assumed that gold-quartz veins of this type cannot be formed at any extreme depths below the surface, probably not below 10,000 feet, for at such depth open spaces could hardly exist. These very large fissure veins are, however, not very abundant; a moderate width of one to three feet is far more common. In many cases, indeed, there are no large open spaces at all, but a network of smaller cracks and fractures in which the solutions deposited their contents.

In the predominating milky white quartz of the veins but few other gangue minerals are found. Calcite, more rarely magnesium carbonate, or a mixture of both, occur occasionally, but always in subordinate quantities and usually concentrated near the walls. The quartz is ordinarily massive, but excellent examples of comb structure may be found. Barite and fluorite are conspicuously absent. A white mica with pearly luster is sometimes found in the quartz at some of the mines along the mother lode, and a green potassium mica, colored by chromium, and which Professor Silliman has called *mariposite*, occurs abundantly in places, though usually not in the quartz itself. Roscoelite, a vanadium-potassium-mica, has been found in one place, and albite occurs in isolated cases. Rhodonite has been found in Plumas county. Titanium minerals, such as titanite, ilmenite and anatase, occur occasionally.

The native gold is distributed through the quartz gangue in an irregular manner. The particles may be of microscopic size, or coarser, and visible to the naked eye as scales, threads and smaller masses. Occasionally large pieces, of all weights up to fifty pounds or more, will be found. In the ores from the larger mines it is, however, rare to find the gold visible to the naked eye. The gold always contains a little silver, in rare cases as much as thirty per cent.

A variable but always comparatively small quantity of metallic minerals accompanies the gold. It varies from a fraction of one per cent to five or six per cent, but ordinarily makes up from two to three per cent of the mass of the quartz. Sulphides are most common, but compounds of arsenic, antimony and tellurium also occur. A list of the associated minerals in the quartz veins would include the following species:

Iron pyrites (universally present).
Pyrrhotite (not common).
Copper pyrites (common).
Zinkblende (common).
Galena (common).
Molybdenite.
Arsenical pyrites (common).
Tetrahedrite.
Antimonial lead sulphides (rare)
Cinnabar (rare).
Tellurium minerals—Hessite, Altaite, Calaverite, Sylvanite, Petzite, Melonite (frequent, in small quantities.)
Nickel and cobalt minerals (very rare).

Marcasite is noticably absent from gold deposits, as noted by Mr. Louis. I have once seen it, however, from a mine at Grass Valley.

These metallic minerals, usually referred to as "sulphurets," contain more or less gold and silver and are frequently very rich, the concentrates ranging from thirty to several hundred dollars per ton.

Bismuth and cadmium have been found in small quantities in concentrates from the Nevada City mines, the former also in Shasta county. Compounds of tin, wolframium, uranium, boron, phosphorus and fluorine appear to be entirely absent. Cuprite, bornite and chalcocite are also lacking. Cobalt and nickel minerals are occasionally present. Titanium occurs sparingly.

A slight influence of the wall rock upon the character of the mineral association cannot be denied. It appears to be a fact that veins in granodiorite contain more sulphurets than those in other rocks. Pyrrhotite appears to be entirely confined to veins in this rock. It is known only from the vicinity of Washington, in Nevada county, Sonora, in Tuolumne county, and Westpoint, in Calaveras county. Veins in black sedimentary slate or on the contact between greenstone and slate seldom contain much besides iron pyrites, and perhaps arsenical pyrites; neither are veins in augite-porphyrite or diabase usually rich in sulphurets. Veins in gabbro often contain copper. These are no strict rules, however, and the influence of the wall rock may, on the whole, be considered as remarkably small.

Gold is universally distributed in the quartz veins of California. The definition of what is ore, or quartz paying for exploitation and metallurgic treatment, will necessarily vary at different times and in different places. Under exceptional circumstances, rock containing as little as one or two dollars of gold to the ton will pay. In the deep mines the tenor of the extracted ore is usually from five to twenty dollars.

In wider veins a small streak near one of the walls will sometimes contain the pay, while the rest is comparatively barren. Equal distribution of value in cross-section is, however, common enough. Considered in projection on the plane of the vein, there is rarely an equal distribution of the gold over large surfaces. The richer ore is concentrated in bodies and masses, which sometimes may be wholly irregular, but which usually show more or less regular outlines. These richer masses are called chutes or chimneys, and appear on the plane of the vein in long-drawn linear or elliptic form, with a dip which usually is above forty-five degrees. Flat ore chutes occur, however, as, for instance, in the Idaho mine, Grass Valley. Their width ranges from a few feet up to several hundred, and their length may exceed 2000 feet. It is not uncommon to find one of these ore chutes give out in depth, but another chute will then probably be found in some place below it, if a thorough exploration is carried out. It is a practical rule in many districts, and one which holds good in a remarkable number of cases, that the chutes dip to the left when one is standing on the apex and looking down along the dip. The explanation of the ore chutes is difficult. They may, as F. Posepny and others have suggested, simply indicate the direction of least resistance for the gold-bearing solutions. This explanation is not entirely satisfactory, for in the intervals between the chutes it is by no means the rule to find the walls shut down tight. On the contrary, it is common to find the barren vein between them as wide, if not wider, than the rich vein in them. An increase in the quantity of the sulphurets always accompanies the increase of gold in the ore chutes.

No gradual decrease in the tenor of the ore takes place with increasing depth; on the whole, the character remains constant. Individual ore chutes may be exhausted, but others, as a rule, are found below them.

Certain veins show no large bodies of milling ore at all, but coarse gold concentrated at certain points; such deposits are called "pocket veins." Small seams may sometimes carry a surprisingly large amount of gold. Intersection of seams or veins often, but by no means always, produce pockets or ore chutes.

The study of the changes and alterations which the rocks adjoining the fissures have undergone is a subject of the highest importance, for in this way a closer insight into the genetic processes of the vein may often be obtained.

It would at first glance seem more likely that the rock in the vicinity of the quartz-filled veins would have undergone a silicification. Such is not the case. Instead of silicification there is, as a rule, a most marked carbonatization, or a conversion of the country rock to carbonates. Most intense next to the vein, the alteration gradually decreases at a distance from it, the width of the altered zone varying according to the width of the vein. The carbonate zone, surrounding the quartz vein on both sides, may often be studied to great advantage in small veinlets cutting through hand specimens.

This action upon the adjoining country rock is in itself, to my mind, the strongest possible evidence against the application of lateral secretion in its narrower sense to these veins. It appears to completely refute the theory of the veins being formed by percolating surface waters, and prove the existence of an ageney active in the fissures and gradually extending outward.

The solutions circulating in the fissures acted with different intensity on different rocks. Nearly all igneous rocks, acid or basic, are profoundly altered, the latter more than the former, and serpentine more than any other. Only extremely silicious rocks, and especially certain carbonaceous slates, appear to successfully withstand the action of these solutions. The process of carbonatization has not in all cases been carried out to its full extent; in some veins it is more marked than in others; occasionally fresh rock may lie close up to the vein. Crushing of the rock next to the vein facilitates the process and increases the width of the altered zone, which may vary from a few inches up to twenty feet, and even more in exceptional cases. With all variations,

there is no doubt that the process is a general one, and characteristic for the type.

The result of the process, when it has been thoroughly carried out, is the conversion of the country rock by replacement to a mixture of carbonates, white potassium-micas (sericite), a small amount of chloritic minerals and residuary quartz; besides, there is always a large amount of iron pyrites, usually more than in the vein. Arsenical pyrites is also frequently present, but never, as far as I know, any other sulphides in noticeable amounts. Calcium carbonate usually prevails, but the carbonates of magnesium, iron and manganese, are also present. According to numerous analyses, calcium is always added, while nearly all of the sodium is carried away. The potassium of the orthoclase remains transferred to the sericite. As abundant potassic micas are often found in wall rocks originally very poor in this metal, it is probable that some potassium was also added. In silicious rocks the quartz is often attacked, but never completely carried away. The iron ores, and partly also the bisilicates of the original rock, appear to have been converted into pyrites, while the titanium in it was transformed to leucoxene.

In the case of clean-cut fissures, with well-defined quartz veins, it is usual to find by far the largest amount of gold in the quartz and in the sulphides associated with it. The altered country rock is not entirely barren, but it does not often contain native gold, and its sulphides are much poorer than those in the quartz. This is not entirely without exceptions, for in several places, usually adjoining rich chutes, the altered country rock will pay for milling, and may, in isolated cases, go as high as $12 per ton. And again, there are cases in which the altered country rock is traversed by a great number of minute quartz seams, in which the gold is concentrated. Such a case is the Rawhide mine, Tuolumne county, in which this altered and fissured country rock is far richer than the main quartz vein. At the same place the gold sometimes also penetrates and coats the cleavage faces of the adjoining talcose or serpentinoid schistose rocks. I have always found such occurrences to be more or less altered rocks from the immediate vicinity of some vein. The gold occurs on minute, sometimes hardly visible, seams traversing them. Indeed, many fissures are absolutely microscopic.

It has been stated above that serpentine is peculiarly liable to alteration by the auriferous solutions. The zones of altered rock are in this case often very large and always very characteristic. They may be twenty or thirty feet wide, or, in the case of branching veins, a whole area, several hundred feet across, may be more or less completely altered. The serpentine is converted into a mixture of magnesic and calcic carbonates, a green micaceous mineral containing potassium and colored by chromium, to which the name of mariposite has been given by Professor Silliman, together with more or less iron pyrites. The altered mass is frequently shattered and traversed by seams of mixed quartz and carbonates. It has a rather coarse, crystalline structure, and a bright green color from the disseminated mariposite. The carbonates referred to as ankerite by Professor Silliman are in reality, as indicated by H. W. Fairbanks, a mixture of varying composition, ranging from calcite to magnesite, and often containing considerable iron. Magnesic carbonate, on the whole, predominates. The mineral mariposite is, as Silliman observes, only associated with magnesian and chloritic rocks. Fairbanks states that it is particularly characteristic of the mother lode. This is not correct. It is, however, eminently characteristic of all quartz veins in or at the contact of serpentine, though occasionally occuring in very small quantities in diabase and other basic rocks. The writer has noticed the same characteristic mixture of carbonates and mariposite from a great many places in the gold belt besides the mother lode; thus, for instance, at the Phœnix and Red Chief mines in Sierra county, and also near Washington, Nevada county. It appears at the mother lode wherever that great quartz vein breaks through serpentine. Quartz mountain, Tuolumne county, is an excellent place to study it.

(To be Continued.)

A Correction.

To the Editor:—In your issue of the 16th inst. you give a summary of the interesting discussion regarding the molecular change which takes place in stamp stems; in the opening sentence you quote me as saying that "vibration under all conditions will crystallize iron." These words are Mr. Argall's, not mine. In my "Limitations of the Stamp Mill", I confined myself to the condition of iron in stamp stems and did not make such a general statement as the above. Yours faithfully, T. A. Rickard.

Salmon City, Idaho, March 26, 1895.

Kingsley endorsed tobacco as follows: "It is a lone man's companion, a bachelor's friend, a hungry man's food, a sad man's cordial, a wakeful man's sleep, and a chilly man's fire." Kingsley himself was a great smoker, and he derived much comfort from the use of his clay pipe.

The Largest Piece of Gold Yet Found Was Worth Nearly $150,000.

To the Editor:—The largest piece of gold, free of quartz, in the world, was taken from the Byer & Haltman gold mining claim, Hill End, New South Wales, Australia, on May 10, 1872, its weight being 640 pounds, height four feet nine inches, width three feet two inches, average thickness four inches, and was worth $148,800. It was found imbedded in a thick wall of blue slate, at a depth of 250 feet from the surface. The owners of the mine were living on charity when they found it.

The Welcome Stranger nugget was found on Mount Moliagel, February 9, 1869; it weighed 190 pounds and was valued at $45,000. It was raffled for $46,000.

The Welcome nugget was found at Bakery Hill, June 9, 1859; it weighed 184 pounds 9 ounces 16 pennyweights, and was worth $44,356. It was raffled for $50,000.

The Lady Hotham nugget was found in New South Wales, Canadian gulley, September 8, 1854; it weighed 98 pounds 10 ounces 12 pennyweights, and was sold for $23,557.

The Union Jack nugget was found February 28, 1857; it weighed 23 pounds 5 ounces, and was sold for $5620.

No name nugget was found at Eureka, Dauttons Flat, February 7, 1874, at a depth of thirty feet from the surface; it weighed 52 pounds 1 ounce, and was sold for $12,500.

The Leg of Mutton nugget was found at Ballarat, January 31, 1853, at a depth of 65 feet; it weighed 134 pounds 11 ounces, and was sold at the bank for $32,380. This nugget was shaped like a leg of mutton, hence its name.

No name nugget was found at Bakery Hill, Ballarat, March 6, 1855, near the surface; it weighed 47 pounds 7 ounces, and was sold for $11,420.

No name nugget was found in Canadian gulley, Ballarat, January 22, 1853, near the surface;. it weighed 84 pounds 3 ounces 15 pennyweights, and was sold for $20,235.

The Kohinoor nugget was found at Ballarat, July 27, 1860, at a depth of 160 feet; it weighed 69 pounds, and was sold for $16,680.

The Sir Dominic Daly nugget was found February 27, 1862; it weighed 26 pounds, and was sold for $6240.

No name nugget was found at Ballarat, February 28, 1855; it weighed 30 pounds 11 ounces 2 pennyweights, and was sold for $7395.

No name nugget was found August 1, 1879; it weighed 12 pounds, and was worth $2280.

No name nugget was found at Ballarat, February 3, 1853; it weighed 30 pounds, and was sold for $7360.

No name nugget was found in Canadian gulley, January 20, 1853; it weighed 93 pounds 1 ounce 11 pennyweights, and was sold for $22,350.

No name nugget was found at Bakery Hill, March 6, 1855; it weighed 40 pounds, and was worth $9600.

The Nil Desperandum nugget was found November 29, 1859; it weighed 45 pounds, and was sold for $10,800.

The Oats & Delson nugget was found at Donolly gold field in 1880, at the roots of a tree; it weighed 189 pounds, and was sold for $50,000.

In addition to the above are the Huron nugget, worth $20,000, and the Empress nugget, worth $27,661. A great number of smaller nuggets, too numerous to mention, have been found.

Many large nuggets or lumps of gold have been found in California during the era of placer mining; but Australia must claim the largest. The California lumps are as follows:

A piece of gold and quartz was found in Calaveras county on Carson Hill, on the mother lode; it was valued at $42,000.

The Downieville lump of quartz and gold, of Sierra county, as stated by Louis Blanding, gave a value of nearly $90,000; but it was not a nugget.

The mass of gold and quartz found in the Bonanza mine, Sonora, Tuolumne county, gave a value of over $40,000.

The Australian statistics are correct, I having obtained them from Government authority. Argus.

Sonora, Cal., March 30th, '95.

The *Iron Age* says within the next six months there will be in operation in this country a total of 196 tin-plate factories, having a possible annual output of 6,350,450 boxes, which is more than the ordinary yearly consumption of the United States. Of these, 157 mills are either built or are in process of construction, and the arrangements have been made to erect within the next six months thirty-nine additional mills.

The illustrated article on the Standard Mining Co.'s plant at Bodie is completed in this issue. Fig. 5 shows that the power is furnished by Pelton wheels, as it appeared in the report of the State Mineralogist, which we were unable to reproduce, and the regulation is effected by the Pelton differential governor.

Mr. W. F. C. Hasson, of this city, has been elected one of the three vice-presidents of the American Institute of Electrical Engineers.

Some Practical Points.

To the Editor:—Getting drills to do work in hard rock may be a simple matter to the experienced mine smith, but to some of us amateurs who have to dress our own tools it is a problem which calls for some consideration. It is with the hope that some of the latter may be benefited that the following suggestions, derived by hard experience and later by some valuable hints from a veteran mine smith, are submitted:

First of all secure good steel, if possible; poor steel is especially dear in hard rock. Do not attempt to sharpen in the sunlight, and carefully avoid overheating the steel as it will often get burned slightly when hardly suspected. As most beginners have better success making a new bit than keeping it in shape, the following applies to the drill dulled by use: Lay the drill upon the anvil corner up and strike the first blows a little diagonally on the corners, which will narrow the bit and have a tendency to bring the steel on the corners out even with the middle to compensate for the wear which is greatest at the corners; also smooth down any irregularities at this time. Never begin on the flat side of the drill. Next turn the drill flat and again strike on the corners a few drawing blows, accompanied by necessary blows in the middle, to make the bit square across the edge; repeat this operation from each side until the bit is in shape, and on the round part of the anvil draw the steel down just back of the edge, to give the drill clearance. Deliver the finishing blows squarely against the level at whatever angle it is desired to maintain, until a sharp edge is secured; again see that the bit will clear itself, and with a few soothing taps on the edge it is done. The amount that the bit should be narrowed depends upon its dullness. A good bit will be nearly if not quite straight across the edge and will have a straight taper on the bevel, which will leave the flattened steel also on a nearly straight line. The steel should not be flattened to less than one-half its size. For ordinary hard granite an angle of 60° gives a good edge; for softer rock increase the cutting capacity by increasing the length of the bevel and not by flattening the steel. Avoid curves, and build the bit as close to the body of the steel as possible.

Allow the drills to cool somewhat, and if using an open fire, place a bar of iron across on which to lay the drills, to prevent the steel from getting heated back of the bit. When a uniformly dark red color is apparent in the shade, plunge the drill into tepid water and let it remain until cool, when, if properly tempered, it will present a speckled appearance. Conditions of light, grades of steel and rock vary, so that a little experience will be the best guide as to the heat required; but drills tempered in this way will not check nor "jump" a bit, and if too hard they will break clean. Geo. F. Willis.

Bishop, Cal., March 20th, '95.

The Good Old Times in Iron Manufacture.

In discussing Mr. John Fritz's recent paper on the "Early Days of the Iron Manufacture," read at the Bridgeport meeting of the American Institute of Mining Engineers, Mr. E. C. Pecbin said:

"For many years Mr. Hughes Oliphant operated a small charcoal furnace and mill at what is now Fairchance, in Fayette county, Pa., at the foot of the Alleghany mountains.

"He told me that early in the century he ran for eighteen months, and saw only $10 in money. I said to him: 'How under heaven did you manage?' He replied: 'We made our iron into nails, rods and kettles, hauled them twelve miles over to Brownsville, on the Monongahela river, loaded them into flat boats, and floated them down the Ohio, swapping our wares for whisky and rum. At New Orleans we exchanged these for sugar and molasses, which we sent by sea to Baltimore, and there we swapped again for groceries and dry goods, which we hauled in Conestoga wagons over the mountains, 300 miles, to our furnace.'"

Book Received.

"*Taxation of Personal Property.*" The author is Thos. G. Shearman, the well-known writer on economic subjects. He argues that the taxation of personal property is "impracticable, unequal and unjust;" he holds that the single tax, that is the tax on land, is the only right solution of the question he raises, and that manufactures, commerce and industry in every form should be released from taxation. As a starter he advocates local option—that is, to have each city or county or district decide for itself whether personal property in those limits should or should not be taxed. He argues well; his arguments, however, have all the attractiveness of theory, unaccompanied by the value that can only attach to tried and proved propositions. The price of the book is thirty cents: it is published by the Sterling Publishing Co., 106 Fulton St., New York.

Labor statistics for 1894 show that in the United States there were twelve per cent, or one-eighth, fewer hands employed than in 1892. That represents an unemployed army of 565,000 persons. In wages earned and not paid it stands for $500,000,000. Applied to product values it shows a falling off of $1,254,000,000 as compared with the year in which the people voted for a change.

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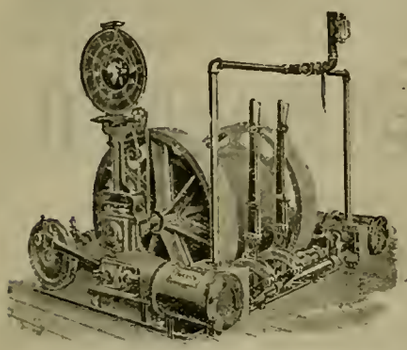

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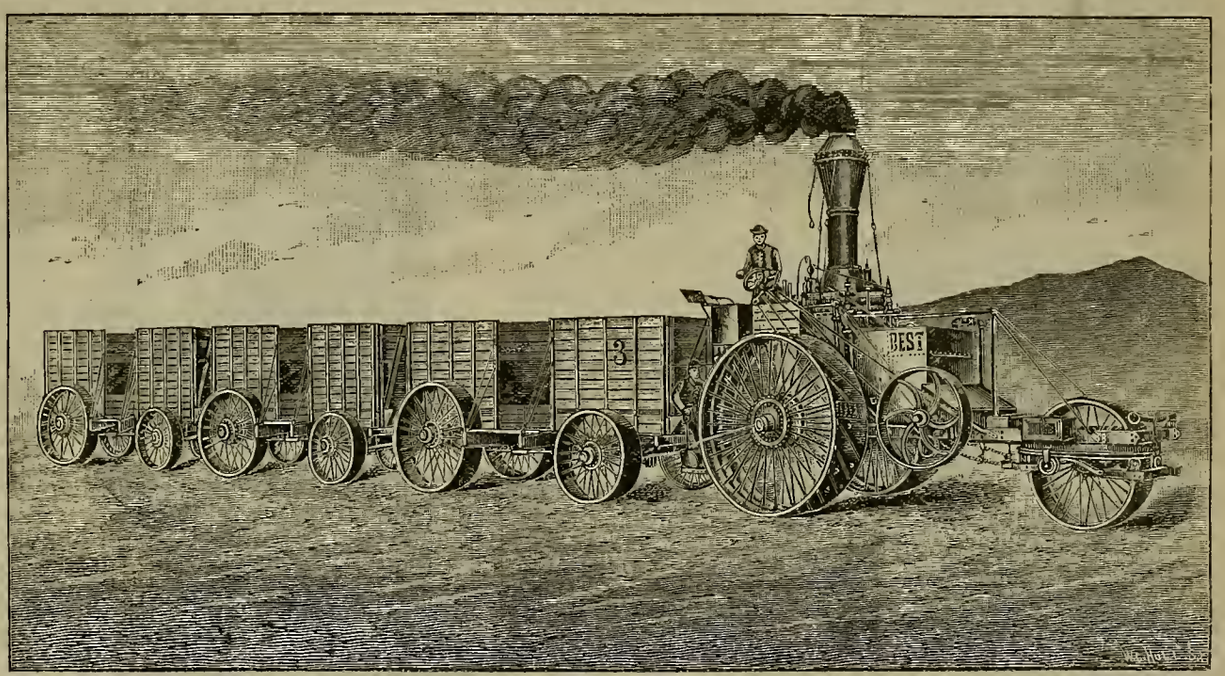

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The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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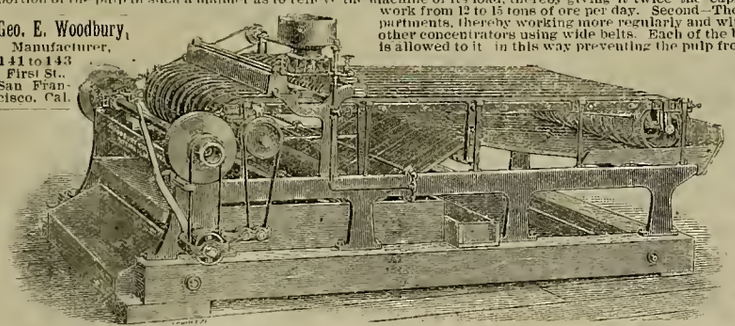

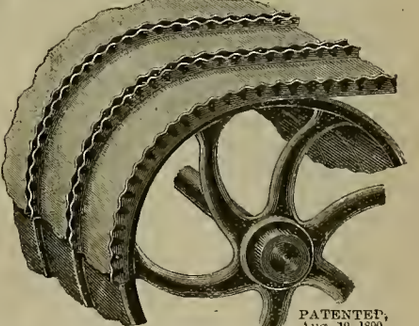

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This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1894.

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Scientific Progress.

Theory of Professor Wellner's Flying Machine.

The essence of Professor Wellner's innovation is his invention of the sail wheel. It consists of a horizontally placed axis with spokes and arched aeroplanes attached to them in a cylindrical form. While revolving round the axis the latter take a slightly slanting position, which causes the forward edges of these surfaces to be inclined, and consequently to compress the air in the way of a sail or a kite, calling into play the vertical force. These ribs, running across each lifting surface and made in the form of a screw, at the same time serve to strengthen the aeroplanes and to add to the horizontal force.

These sail wheels, set in pairs, can be placed, according to the size of airship aimed at, in one or more groups of two wheels, revolving in opposite directions, behind or beside each other. The cigar-shaped car, furnished with a motor and carrying the aeronants, is attached horizontally under the center of the wheels, so that the whole construction will resemble a colossal bird, propelled, instead of by wings, by revolving wheels, the lifting surfaces of which are consecutively and constantly developing vertical and horizontal power. The bird's movements in flying and the speedy headway motion necessary to the kite-flying machines for their support in the air are in Prof. Wellner's invention changed to a rotary motion. This construction, while permitting of an easy, slow ascent, assures the horizontal position and constant stability of the airship, at the same time permitting of a high velocity.

The more the latter is increased the stronger is the lifting power developed. The direction is given by a rudder at the end of the ship or by increasing the velocity of the sail wheels on one side only. It is the peculiar quality of these wheels that they do not, as might be supposed, disperse the air around them. They rather attract it toward their rapidly moving surface, condensing it to a powerful stream, which passes down obliquely through their cylinders. Their velocity can be made to surpass by far that of railway trains, thus enabling them to conquer contrary winds and air currents.

Iron Older Than History.

Iron was used before history was written. The stone records of Egypt and the brick books of Nineveh mention it. Genesis (ix., 22) refers to Tubal Cain as "an instructor of every artificer in brass and iron," and in Deuteronomy (iii., 11) the bedstead of the giant Og was "a bedstead of iron." The galleys of Tyre and Sidon traded in this metal; Chinese records ascribed to 2000 B. C. refer to it; Homer speaks of it as superior to bronze. The bronze age came before the iron age, because copper, found as a nearly pure metal, easily fuses, and with another soft metal—tin or zinc—alloys into hard bronze; while iron, found only as an ore, must have the impurities burnt or hammered out by great heat and force before it can be made into a tool. The word sometimes translated "steel" in our English Bible really means bronze or brass, but steel was distinctively known to the later ancients. Pliny the Elder wrote in the first century of our era: "Howbeit as many kinds of iron as there be, none shall match in goodness the steel that comes from the Seres (Chinese), for this commodity also, as hard ware as it is, they send and sell with their soft silks and fine furs. In a second degree of goodness is the Parthian iron." Asia probably made more iron and steel thirty centuries ago than it does to-day. About the time of the first Olympaid, 779 B. C., there is authentic record of the use of iron in Greece, and Lycurgus used it for the money of Sparta. Iron and steel weapons of war began to displace those of bronze before the battle of Marathon. The Romans learned iron making from the Greeks and the Etruscans, their mysterious and highly civilized neighbors, and obtained iron largely from Corsica, where the mines had been worked from prehistoric period. The Roman legionaries found in Spain steel weapons of the finest temper, and Diodorus says that the weapons of the Celtiberians were so keen "that there is no helmet or shield which cannot be cut through by them." Toletum (now Toledo) was then as famous for its sword blades as afterward in the middle ages. Cæzar found the painted Brittons fighting with spearheads of bronze, but wearing armlets of iron, and remains of pre-Roman forges are still found in England and Wales. The Germans knew the art of sword forging, and their legions of dwarfs and trolls with magic swords point to an earlier people, adepts in mining and metallurgy.

Ink Eraser.

Please inform me how to make a solution that will erase ink and ink blots without leaving any trace on the paper.

1. Tin chloride, two parts; water, four parts. To be applied with a soft brush, after which the paper must be passed through cold water. 2. Thick blotting paper is soaked in a concentrated solution of oxalic acid and dried. Laid immediately on a blot, it takes it out without leaving a trace behind. 3. The "Journal de Pharmacie d'Anvers" recommends pyrophosphate of soda for the removal of ink-stains. This salt does not injure vegetable fiber, and yields colorless compounds with the ferric oxide of ink. It is best to first apply tallow to the ink spot, then wash it in a solution of pyrophosphate until both tallow and ink have disappeared.

JUPITER takes eleven years and ten months in making his journey around the sun. Thus, our earth travels nearly twelve times around the sun while Jupiter goes around only once. This is easily explained, since Jupiter is five times farther from the sun than our earth, and therefore has a greater distance to travel. For the same reason, Jupiter receives much less light and heat from the sun than we do. In each second of time Jupiter's giant bulk moves eight miles, a rate which is about five hundred times faster than the swiftest express train.

AN ink for writing on glass is prepared as follows: Dissolve 36 parts of fluoride of sodium in 500 parts of water and add 7 parts of sulphate of calcium. Prepare a second solution by dissolving 14 parts chloride of zinc in 500 parts of distilled water and add 65 parts of strong hydrochloric acid. For use, equal parts of these two solutions are mixed together and diluted a little, or mixed with some ordinary ink in order to make it flow better. Very fine writing and drawing may be done with this ink.

THERE are now fifty-four so-called metals whose physical properties are well known, and there are fifteen others whose properties are being investigated. These latter materials are the recently discovered idunium, davyum, mosandrum, holmium, samarium, norwegium, veshium, neptunium, lavoisium, uralium, harcenium, colshim, rogerium, comesium and actinium.

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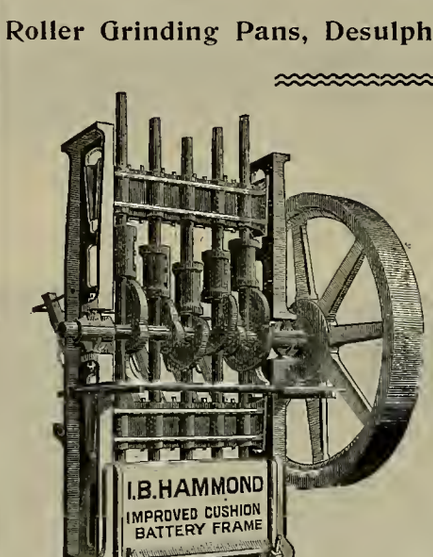

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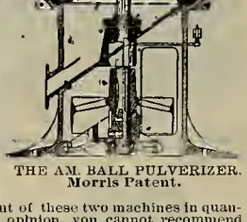

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JAMES H. LANCASTER, Patentee, 39 Cortlandt St., NEW YORK.

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Mechanical Progress.

The Straining of Boilers.

There are few things more annoying to a steam user who has just put down new modern steam boilers than to find them exhibiting signs of straining and leakage in a few weeks, or mayhap in a few days, after being put to work. Possibly no expense has been spared in the equipment of the boilers, to have them up to date and in accordance with the most approved practice; but, notwithstanding all the precautions taken, straining occurs, and often shows itself by leakages at the rivets securing the gusset stays to the front end plate. Although less likely to have serious consequences than concealed leakages, they are none the less aggravating because visible to all and sundry who may be brought to look at and admire the new boilers, which it was fondly hoped were the best that money could buy. However unpleasant this experience may be, it is that of many firms who, in order to keep pace with the times and meet competition by cheapening production, have tripled or quadrupled their engines, and replaced boilers working at moderate pressures by new steel ones suitable for 150 to 200 pounds working pressure.

It is interesting to trace a few of the causes of this straining in new boilers, and to point out how they may be avoided. One of the most frequent, perhaps, is that of making the end plate too rigid, either by having it too thick or too rigidly confined by the end stays, thus preventing the plate from slightly buckling, or "breathing," in sympathy with the elongation and shortening of the flue tubes, constantly occurring with variations in temperature.

Another prolific cause of straining is the overheating of the plates, resulting from the use of impure feed water. When the water is impregnated with mineral matter, in the form of carbonate and sulpbate of lime and magnesia, etc., unless means are taken to prevent it, the lime salts are precipitated and deposited on the heating surfaces as scale, preventing contact of the water with the plates, and overheating and unequal expansion ensue, in addition to more or less waste of fuel. The overheating from this cause is increased when carbonate of iron is present in sueb quantity as to thicken the water and retard steam bubbles in their passage to the surface of the water.

Another and more serious source of mischief is the presence of oil in the boiler, admitted with the feed water when taken from the hot well of a jet condensing engine, or heated by direct contact with steam from the cylinders. This, especially where the water contains carbonate of lime, is responsible for a great deal of the trouble arising from straining. The oil, which may have been carried into the boiler in a free state, or in finely divided particles intimately mixed with the feed water, is left behind on the latter being evaporated, and accumulates until in sufficient quantity to combine with the particles of lime in the water. This settles in the form of globules on the crowns and upper sides of the furnaces, effectually keeping the water from direct contact with the metal, thus interposing a barrier to the free transference of the heat of combustion to the water, with the result that the temperature of the plates is increased to such an extent as to produce severe straining at the seams and end plates, even if actual distortion or collapse does not take place.

One other cause should be referred to, as it is of very common occurrence, especially in small plants, viz., feeding the boilers with cold, or comparatively cold, water. In modern plants, consisting of one or more large boilers, it is usual to pass the feed water through an economizer or heater placed in the main flue, by which means it is raised to a very high temperature by utilizing a portion of the heat from the waste gases, which would otherwise be lost up the chimney. There are, however, hundreds of new boilers put in, to say nothing of the thousands of old boilers, which are fed with water only slightly heated, or even at the temperature at which it is obtained from the main reservoir or well. Did the owners but realize that by the one fact of using cold feed water they were not only wasting between 10% and 18% of fuel, according to the temperature of the feed water and the steam, but also shortening the lives of their boilers by years, besides running the risk of heavy expenditures for maintenance, they would at once take measures to obviate such a wrong state of affairs. If inconvenient to put down an economizer, the water could readily be heated by means of an exhaust or live steam heater, or by an injector, to the great advantage of the owner.

We have seen that there are four chief causes for the straining of boilers, viz: End plates too thick or too rigidly stayed, impure feed water, presence of oil in the boilers, and the use of cold feed water. The first cause can very often be removed by dispensing with the bottom rivets securing gusset stays to the end plates. Impure feed water can generally be purified by suitable treatment before going to the boiler, by a chemical process and filtration; or, if the first cost of the plant necessary is too great, or space is very limited, by introducing suitable reagents adapted to treat the impurities found by analysis to be present in the water. By the latter method the lime salts, etc., are rapidly precipitated, and rendered easily removable by blowing out, in addition to gradually softening existing incrustation. If mineral oil of good quality be used in the cylinders only in such quantities as are really required for lubrication, there is no serious danger to be apprehended from the small proportion reaching the boiler with the feed water, unless there be carbonate of lime present in considerable quantity, in which case oil should not be admitted under any circumstances whatever. Good results have accrued in many instances from fixing an oil and water separator on the feed pipe, between the pump and boiler, to intercept any free oil which may be present in the water.—Practical Engineer.

Arrangement of Machinery in Power Stations.

Three general methods of arranging machinery of power stations are common in the United States. In one the power is transmitted from the prime mover to a line shaft, and thence, by belting, to the dynamos. This we will call the line-shaft system. In another the power is transmitted by a belt or rope from the prime mover directly to the dynamo. This we will term the direct-belted system. In the third the shaft of the dynamo or generator is directly connected to the prime mover, and has the same speed of rotation. This we call the direct-connected system. Regarding these several systems, it may be said that local conditions or surroundings may be such as to render it advisable to adopt one or the other. The writer, however, believes that it will be seldom or never necessary under present conditions of manufacture to adopt or use the line-shaft system. That system is objectionable for various reasons.

The direct-belted system is to-day the cheapest in first cost and in many respects the most satisfactory to operate. The arrangement of the generators, distinct from the prime movers and connected by flexible connections, makes it possible to repair accidents with great facility and convenience. In general, with this system, only one or at most two generators can be driven from an engine without the use of riding belts. With the condition of the market as at present, however, with generators available of any size required, this matter is of little practical importance.

The direct-connected system is without doubt the ideal system, since transmission losses are eliminated and the power occupies a minimum amount of space. The cost to-day would be about twenty per cent in excess of the direct-belted, but not essentially greater and possibly even less than that of a well-constructed line-shaft system. The American practice in building direct-connected machines is to extend the main shaft of the engine and suspend the generator armature on the end, either with or without an out-board bearing. The English system is somewhat less rigid, the engine shaft being connected to the dynamo with a coupling.—Prof. R. C. Carpenter in Cassier's Magazine for April.

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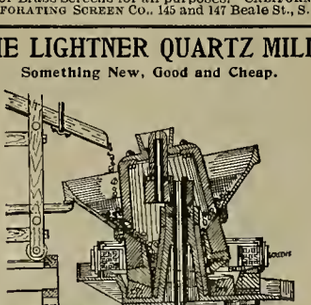
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MINING ITEMS—BELL WETHER.—*Republican:* By the terms of the verbal agreement between S. W. Bright and Jos. Underwood and Dr. Snedeker, of Chicago, for the disposal of this property, the latter are to commence work on or before the first day of May. From the commencement of work until the mill is erected and in running order, Mr. Bright is to receive $300 per month. After the mill is in operation, 20% of the gross proceeds is to be paid to the owner until the full amount is paid, which we understand is $110,000. The purchasers are required not only to commence work at the above time, but to prosecute development work, and the erection of a mill to completion as soon as possible.

ALMA.—At this mine the shaft has reached a depth of 390 feet. At the depth of 400 feet it is intended to drift for the ledge, which it is believed will be tapped withiu 100 feet of the shaft. While drifting is in progress, sinking will be continued—at any rate, to the extent of providing a sump to hold the water. A month or six weeks ought to suffice to reach the ledge, unless its departure from the usual dip of the mother lode toward the east is much greater than is supposed. On the surface, especially where, as in this instance, the country is considerably broken up by upheavals of the earth's crust, the extent to which this has affected the pitch of the ledge near the surface is always more or less problematical.

Robert Aitken has sold his interest in the Clyde quartz claim to the Kennedy Mining Company, for $1500. The Clyde joins the Kennedy on the east.

The mill of the Smith brothers, on the Clough place, near Volcano, has come to a standstill. The reason for the stoppage is not known. It has been reported that the parties were more than satisfied with the yield of the rock so far, and that there was no doubt that the sale of the property would be completed. The shutting down of the mill following the circulation of these cheering reports is inexplicable.

NEAR VOLCANO.—Adams & Hanley have a vein of ribbon rock on the Hanley claim, near Volcano, which, it is though, will mill $150.

THE HANCOCK, MIDDLE BAR DISTRICT.—The company which is prospecting the Hancock mine has driven its tunnel in southward in the footwall of the ledge aud is in a little over 200 feet and still pushing forward. Harry Summers has charge of the work.

THE ALMA, JACKSON DISTRICT.—In order to enable them to make some kind of estimate as to the timber to order this summer, and incidentally to ascertain the pitch of the ledge and its value, the Alma people suspended sinking a few days ago and are now eugaged in crosscutting to the ledge from the 400 level. As soon as the ledge is encountered, and its width, pitch and assay value ascertained, they propose to continue sinking.

Butte.

AROUND BANGOR.—The Catskill has forty men at work and the gravel has paid regularly since the new company began operations. The owners of the Turner mine have struck excellent gravel and will soon be taking out gold. Two young men, Peter Berdell and Henry Devol, while out prospecting for quartz struck a pocket of quartz gold and took out $800 in five hours work.

ON HOLTE'S FLAT.—The Holte Mining Company is developing a gravel mine on Holte's Flat. Supt. Burroughs has a crew of men engaged in running a cut from the flat to the river. He expects in a short time to strike bedrock and then will commence drifting.

AROUND MAGALIA.—At the Alki mine several men are employed: Supt. Geo. Parry will soon be taking out gold.

The incline on the Aurora mine is down 190 feet. There is but little water in the bottom and the surface water does not occassion much trouble. About ten men are at work and they will reach the face of the old workings about the first of May.

In the big Magalia mine matters are assuming shape for renewed sinking of the great shaft. A big Dow pump, weighing 14,000 pounds, or about three times as much as the ordinary mining pump, is being built in San Francisco and will soon be completed. A gigantic compressor is in place and is run by water power. The air compressor is a compound one and exerts immense power. This will be used for pumping. The hoist will be run by water power. There is now about 100 feet of water in the shaft, but this will soon be pumped out and work resumed in sinking the shaft. The air compressor is capable of exerting a force equal to 300-horse power, while double this power can be developed in case of necessity.

Calaveras.

BOSTON MINE.—*Chronicle:* The water-power hoist is in running order and of sufficient capacity to sink the shaft 500 feet. The two-compartment shaft has reached a depth of 50 feet. The winze inside of the main tunnel has been suuk 45 feet and a crosscut made to the footwall of 19 feet in very rich quartz heavily charged with galena sulphurets. A milling test of the winze ore gave $65 in gold aud 7 ounces in silver. Five hundred feet to the south of the shaft the lead has been cut across with an open cut and the vein was found to be 35 feet wide and giving an average assay of $7.53. This part of the lode will furnish quartz for a twenty-stamp mill for the next ten years at a large profit, for the quartz can be broken and milled for $1 per ton. No hoisting of ore need be done, as there are 225 feet of backs above the tunnel level. Seventeen men are at work preparing the mine for cheap and economical working when the twenty-stamp mill shall have been put in for crushing ore, which will probably be during the next ninety days.

El Dorado.

THE TOCKEY MINE.—The ten-stamp mill at the Tockey mine is nearing completion.

Inyo.

NEAR INDIAN WELLS.—J. Lee and F. Meysan are reported to have discovered the biggest gold ledge and property ever found in the county, near Indian Wells. Some rich samples are shown in Keeler. About ten claims have been located and all the available ground has been taked up. No flattering reports have been received only from the first location, which may only be a small rich pocket.

Mendocino.

A PROBABLE FIND.—Mendocino produces other things than lumber. Miners with primitive appliances years ago made as much as $3 a day out of the gravel in Gold gulch, some few miles north of Ukiah, at times in a rainy season, when there was plenty of water available, and now a gold-bearing quartz ledge is reported discovered on the south fork of Big river.

Nevada.

A PROBABLE PURCHASE.—Louis Janin has been looking at the Boss mine on the San Juan ridge, and it is thought Jas. D. Hague will shortly buy it.

AN ASSESSMENT.—An assessment of five cents per share has been levied by the Gold Point Consolidated Gold and Silver Mining Company.

GETTING READY.—*Transcript:* W. F. Englebright is engaged in surveying the exterior and interior boundaries of the Mayflower quartz mine, at Cauada Hill, and will make a map of the property for the company.

AT MEADOW LAKE.—*Republican:* Salt Lake men are honding mines in Meadow Lake district. It is understood that the Salt Lakers have discovered a process by means of which the ores of the district can be profitably worked. About the only base metal in the ore is iron. The great trouble is a superabuudance of iron. Most of the lodes may be described as veins of iron ore containing gold. In the early days when these mines were first discovered a great deal of gold was obtained by sluiciug, panning and sacking the decomposed croppings of the veins, but at depth, where the iron was bright and solid, no milling process would get the gold. I have always believed, says Dan De Quille, that the cheapest way to work the ore would be to crush it, run it out upon a patio, salt it down and leave it till thoroughly oxidized and decomposed, when it would be an easy matter to wash out the gold.

THE HARMONY.—*Herald:* In the Harmony gravel mines at Nevada City a drift is now being run across the channel. It is now in 120 feet, and the gravel is still good. As soon as the mine is opened so that men may be worked to advantage, a large force will be put on.

WASHINGTON DISTRICT.

GETTING READY.—*Herald:* Supt. Fisk is prepariug for the summer's work on the Ogdensburg and St. Lawrence gravel mines at the headwaters of Fall creek. On account of the deep snow all operations were suspended, but as soon as possible the development work will be continued. Excellent prospects have been obtained so far and all the indications are towards improvement.

Orange.

REOPENING THE BLUE LIGHT.—Orange *News:* The Blue Light mine, in the Silverado canyon, is being reopened. The trail to the mine has been cleared and widened, and Mr. Dunlap has just returned from San Francisco, where he purchased all the machinery necessary to break, pulverize and cocentrate the ore. A ditch is being constructed along the north side of the canyon, where, in a distance of half a mile, over 124 feet fall can be obtained. The water will be utilized as power and will operate the machinery by means of a Pelton water-wheel. The ore contains both gold and silver in paying quantities.

Placer.

MINE BONDED.—*Herald:* Bell, Seaver & Wyman have bouded their rich claim at New England Mills to Messrs. Col. Wallace, B. F. Hartley, G. E. Evans and M. T. Lawrence. The figure is said to be a large one.

MINING NOTES.—*Sentinel:* Preparations are being made at the Alta mine to draw the water from the old works before connection is made through the new tunnel. It is expected to tap the old mine some time during the coming summer.

W. Gray is running an upraise in his mine, the Rough and Ready, at Dutch Flat, and soon expects to tap gravel.

Phil Bailey and John Uren have begun work in the Oak and Cedar mine, just below Dutch Flat. They will drive the bedrock tunnel ahead and hope to strike the channel in about fifty feet. The tunnel is in about 500 feet already.

Everything is in readiness at the Golden Shaft to erect the mill recently purchased, with the exception of the timbers, which will have to be brought from below, as it will be too late to wait for the mills to start up. Owing to the excellent quality of gravel found in this mine, its future is awaited with much interest. If it proves a success it will doubtless stimulate prospecting very much in the vicinity of Dutch Flat and Gold Run.

Plumas.

THE BUTTERFLY MINE.—*National-Bulletin:* In consequence of a lack of power only five stamps of the mill of the Butterfly mine are running.

AROUND LAPORTE.—The Pioneer mine has an increased number of men and is paying handsomely. The Cleghorn is preparing for considerable work this season. Packer & Hendle are about to work several miles of the bed of Slate creek.

THE THISTLE MINE.—Nearly 100 men are now employed in and about the Thistle mine, which is considered to be the richest drift mine in northern California.

Riverside.

AROUND PERRIS.—At the Good Hope mine fifty-three men are now employed; the output is about fifty tons of ore daily. The Santa Rosa, six miles distant, has a 320-feet shaft and about 1440 feet of drifts. A ten stamp mill daily handles twenty-five tons of $20 ore. Thirty-two men are employed. The Santa Fe is close to the Santa Rosa and is being reworked by Supt. Stover with good indications... There are about forty claims in the vicinity in which considerable developing work is now being done.

San Bernardino.

VANDERBILT DISTRICT.

Montgomery is still pushing ahead, and will in all probability make a lasting camp. There is not only one good mine there, but several. A large portion of the ore is of very rich character, running as high as $500 to the ton in gold, and is also very free milling. There are at the present time twenty-five tons of machinery on the road for this camp, and two six-horse teams have been busy for some time past hauling provisions alone from Vanderbilt. There are forty men employed, with a likelihood of several more being put on in the course of two or three weeks. Montgomery is about 120 miles from Vanderbilt.

Gus Williams and Pete Wagner are having ten tons of Shadow mountain ore milled at Campbell's mill.

Several of the men who worked for Gaselle at the Shadow Mountain mines have placed an attachment on the property for two months' pay. It is reported that there is plenty of good ore in sight, enough to more than pay off the indebtedness, providing the mill can save a large proportion of the gold.

IN HOLCOMB VALLEY.—The Holcomb Co., an English company, is working twenty-five men on their placer property, using a steam shovel and revolving screen amalgamator, the six feet gravel bed going from forty cents to $1.00 per yard. Considerable money has been spent on this property and present indications favor satisfactory returns.

San Diego.

RICE DISTRICT.

At this new district, near Warner's ranch, the Daisy and Bertha shows a three foot vein of $20 ore. A 350-feet tunnel is being run. The Morning Star and Yellow Hammer are being developed, each showing a four-feet vein of pay ore. A fine stamp custom mill will be built this season.

BANNER DISTRICT.

Fifteen dollar rock is being produced at the Ready Relief and Redwood mines. In the Hubbard, adjoining, a tunnel 100 feet below the old works is being run to the ledge.

Shasta.

A SAMPLE OF MANY.—Free *Press:* H. Cochran, a prosperous miner of French Gulch, was here this week to file a mineral affidavit in the Land Office on the odd-numbered section on which his claim is located. He can offer ample proof that the land is mineral in character, for inside of one month he took out ore that netted him $1500 in cash. He crushed fifty tons which average $40 to the ton.

A LUCKY FIND.—Redding *Free Press:* Recently one Taylor, who came up here to work for the sandstone company on Clear creek, was fortunate enough to find a piece of gold and quartz which weighed 52 ounces. Clear creek has been rich in placers, and this man had occasion to repair a fence where there was an old dump pile of tailings. On this dump, amid stones and gravel, lay this lump of gold aud quartz as big as your two fists. Of course he picked it up, and at once became richer by at least $600. No doubt this nugget had been deposited years before by some placer miner, who threw it away, covered with mud, with stones from his longtom. The man who had earned it by his labor did not get it, but a stranger instead.

A few weeks ago, near Delta, a miner, in clearing away a place to erect an arrastra, picked up a lump of gold weighing $63. Gold will be found from time to time until the day of resurrection.

THE TELLURIUM. — *Free Press:* William Stevens has the contract to erect the works for the Tellurium Company, which he expects to finish about the middle of next month. The process for saving the gold, as introduced by A. F. Murdoff, and briefly explained by Stevens, is as follows: The ore will first go through the rock breaker, then into a drier; from the drier to the stamps at present in position, which will be used temporarily until a pulverizer is provided. The product will then be elevated to tanks containing a secret solution which is supposed to dissolve the gold. The gangue will next be run into a filter, through which the solution will be forced by means of steam, and will then be conducted to precipitating tanks, where, after the gold is precipitated, the solution will be elevated to the tanks first mentioned, to be used on the next batch of ore. By this process it is expected to make a profit on low-grade ore.

A RICH MINE.—*Free Press:* Ellery brothers, who own a mine at French Guleh, recently discovered and located, made a cleanup from a short run of about a week with a Huntington mill, and got 100 ounces of amalgam, or about $1600.

Sierra.

THE ALASKA MINE.—Grass Valley *Tidings:* It is reported that the mill at the Alaska mine had to be shut down, owing to the machinery being worn out. A new mill will probably have to be built, and it is thought an electric plant will be put in.

Sonoma.

DECLARING DIVIDENDS. — James Mead, a stockholder in the Great Eastern quicksilver mine, twelve miles from Healdshurg, reports that thirty men are at present employed in that mine, and healthy dividends are being declared.

NEVADA.

STOREY CO.

ON THE COMSTOCK.—The average of Con. Cal. & Virginia ore is rapidly rising. It is now up to $56.83 a tou. The Chollar people are shipping ore to the Nevada mill that averages $33.46 a ton. The Nevada mill is in Virginia City, and is run hy electricity. The Potosi is yielding ore that averages $48.53 a ton. The low-grade Savage ore, now being mined, averages $19.86. The Crown Point low-grade averages $9.86, $8.73 of which is gold. They extract about 650 tons a week. The ore of the Belcher goes $17.26 a ton. At the Alta they have found au eighteen-inch streak that averages $40. The ore of the Hale & Norcross averages $48.89. On the 500 level of the Occidental they now have ore that averages $41 a ton.

The following official reports have been placed on file in their respective offices:

BELCHER.—On the 300-foot level the joint Belcher and Seg. Belcher drift is in 112 feet from the shaft; the face shows porphyry and quartz of no value. They have hoisted during the week aud stowed in the ore dump at the mine 37 tons of ore of the average top-car samples assay value of $33.95 per ton.

CHALLENGE.—From the surface tunnel the joint Confidence and Challenge raise is up 37 feet; top shows quartz of no value.

SEG. BELCHER.—On the 200-foot level the main south drift is now 454 feet from the Belcher shaft; face in porphyry. Hoisted during the week and stored in the ore-house at the mine ten tons of ore, the average top-car samples of which show an average assay value of $33.15 per tou.

SAVAGE.—On the 950-foot level the south drift started from face of the sill floor, south-east drift, was advanced 18 feet; face is in low-grade ore. The east prospecting drift, started from the fifth floor of the ore stopes above the 1000 level, is advanced 36 feet. This drift has passed through 30 feet of low-grade quartz. They are repairing the main hoisting shaft from the 950 to the 850 level, and have hoisted no ore during the week. On March 29th they shipped to the United States Mint at Carson 232 lbs of bullion of the assay value of $5378; net coin value of the same $3276.

CROWN POINT.—In the Crown Point mine during the past week they continued to extract from the stopes between the 600 and 700 levels, and above the former the usual amount of ore, and have shipped to the Mexican mill 544 tons and 980 pounds of the same. The average battery sample was $11.24 per ton, of which $9.95 was gold. There is no particular change in the condition of the stopes except that above the 600-foot level the pay has narrowed and is practically exhausted, but as they follow north on the 600-foot level the width is maintained and the grade is from $7.50 to $10 per ton.

LINCOLN.

BIG ORE BODY.—The Salt Lake *Tribune* tells of a big find of valuable ore near the boundary line between Utah and Nevada, in Lincoln county. There is said to be more than an acre of surface croppings, which assay $5 to $6 in gold and $4 in silver. The property is located fifty miles west of Frisco, Utah, in a country that affords abundance of wood and water for mining purposes. The expert became so delighted with the property that he took a hond on it, the amount of which is understood to run considerably above $100,000.

ARIZONA.

TOMBSTONE DISTRICT.

GOLDEN QUEEN MINING CO.—The *Prospector* is in receipt of information, from undoubted authority, of the incorporation of a company of New Orleans capitalists to work a group of mines in Tombstone district.

The company is capitalized for $1,000,000, divided into $100,000 shares of a par value of $10 each. The sum of $50,000 has been paid in as a working capital. The name of the corporation is the Golden Queen Mining Co. The Plans have not all been perfected yet, but it can be positively stated that inside of thirty days work will be commenced on a large scale on some of the choicest virgin ground in this district.

BIG BUG.—*Courier:* There is daily expectation that the Pratt mill will be started up when the Bell, the Beleher, Hamilton and Poland will begin to take out ore.

LYNX CREEK.—The Howell or Morse mill on Lynx creek has been running on ore from a claim between the Pine Mountain and Shelton group.

THE HARQUA HALA.—*Times:* This gold-mining camp, located northeast of Yuma, in Yuma county, still remains one of the best camps on the Pacific coast as a bullion producer.

The number of men at work on the company's property is about 100, and there are 500 people in the camp.

Considerable prospecting and development work is going on in the district on private claims. The ore which is being run through the mill is from the Bonanza and Golden Eagle, the ore from the latter having to be hauled a couple of miles. According to the superintendent's reports the bullion output for the past year has been from $15,000 to $25,000 a month. Freight still goes in by way of Aztec, as the new railroad does not go near enough to the camp to lessen the distauce to haul.

Isaac Hester, with twenty head of horses, is

kept busy delivering freight to the mine, a distance of sixty-five miles.

BRITISH COLUMBIA.

AROUND THREE FORKS.—Soft weather and the inability of the Nakusp-Slocan railway to handle the output, has compelled the closing down of the Reco and Goodenough mines, and it is not improbable but that others will follow suit for the same reasons.

The ore blockade in the different warehouses and at the concentrator spur reminds one of the famous wheat blockade in the Palouse country a few years ago. Could transportation be had the product of this winter would have exceeded the estimates made last fall, which were placed at 10,000 tons. The railway people could not be made to believe this, however, and put 2500 tons as the quantity which would be shipped. From one mine, the Slocan Star, more than this entire amount has been furnished, and had no shipping facilities, Mr. White could have doubled his output.

The concentrator below town keeps grinding away on Almo and Idaho ore. Engineers have finished the surveys for tramway lines leading from the Idaho, Almo and Cumberland mines to the concentrator. The main tramway will be double tracked, 7000 feet in length. From it three others, from 1500 to 2000 feet in length, will lead to the different mines owned by the syndicate. A flume two by three feet and two miles in length will be built at once to convey an adequate supply of water from the south branch of Carpenter creek to the concentrator, as heretofore the entire works could not be operated on account of a scarcity of this necessary agent in concentrating.

Lack of funds to make the second payment has caused the holders of the bond on the Fisher Maiden and Silverton, on Four-Mile creek, to throw up the bond, although it is claimed the mines looked well. Fifty tons were shipped last fall, which ranged from 265 to 347 ounces silver per ton. This is dry ore, pure and simple, carrying no lead. The original owners have a fairly well developed property, quite a quantity of ore mined, and the first cash payment to console them for their disappointment.

Finch & Campbell have forfeited their bond on the Wonderful group, three miles from Three Forks.

COLORADO.

AROUND IDAHO SPRINGS.—Several mines which have been having ore treated at stamp mills have tried the system of concentration, and find more values are saved by this process. As soon as arrangements can be perfected with the milling people the ore will go to the concentrators for reduction. The mills recently started up are not working to their full capacity, as they prefer having the ore piled up than a scarcity on account of the early floods which may interfere with the hauling. Contracts are being made for future treatment and the indications are encouraging for an early rush. The mines located back in the mountains are piling up ore and also have immense bodies ready to be taken out. Considering the fact that the mills have been working all winter on ore convenient to the town it can be readily seen that every one of them will be taxed to its full capacity working twenty-four hours each day and seven days each week. Yet all of these will not be able to treat the output of low-grade ores.

There has developed a great rivalry for lead ores and that class of ore which has hardly paid treatment charges has taken such a big bound forward that a handsome profit can be made out of them. The smelters are making good offers to both the ore buyers and the miners, and leasers are trying to secure mines producing lead ores. The camp has an abundance of this class of ore and work in such mines will alone cause great activity.

MOLLIE GIBSON REPORT.—The annual report of the Mollie Gibson Mining Company was made public last week. It has been awaited anxiously for some time. It is quite lengthy. The report shows that, while not comparing with other years, there has been a fair profit from the ores mined. The development work has been largely confined to the prospecting of a comparatively limited territory above the tenth level. About September 1st there was discovered in the ninth level about the only extensive body of ore opened up during the year. Six weeks of stoping netted about $150,000, but the ore was cut out by a horse, which stopped the dividends, which had been resumed.

The report shows further that the gross amount of ore extracted was 12,425,812 pounds, which contained 764,120.94 ounces of silver. This had a gross value of $460,452.47, but the net cash returns, after all smelting and other charges, was $356,881.27. The company now has $175,780.17 in the treasury, besides many other valuable assets.

SALE AT ASPEN.—The Free Silver property and fifteen acres of the Williams ranch which underlies the end lines of the Smuggler ground has been sold to the owners of the Smuggler property for $200,000.

IDAHO.

REPORTED STRIKE IN THE ALTA.—A Boise, Idaho, dispatch reports a strike in the Alta mine at De Lamar. An air shaft is being sunk. Some time ago it struck into mineralized matter, apparently a flat vein, similar in that respect to the other veins in that vicinity. Sampling and assaying are said to show that the average value of the first fifty feet of ore is $27 per ton in gold. The next eight feet averages $70 per ton in gold. Below this the shaft has penetrated two and one-half feet of ore that has not yet been assayed, but which shows to be very rich. The Alta mine adjoins the De Lamar mine. It was recently bonded to Dutch parties, who have transferred the bond to Chicago capitalists.

MONTANA.

A SURFACE STRIKE.—Warren Decamp has struck a good prospect on the Halford ranch, about 1000 feet east of the shaft he has been sinking during the winter, says the Lump City (Mont.) *Miner*. At a depth of seven or eight feet ore was encountered which assayed 162⅔ ounces per ton. A surface assay went $20, and the improvement has, therefore, been very rapid. The quartz is fine-looking, the walls well defined, starting down as true as if formed by human hands. The lode is strong, wide one, and gives evidence of widening with depth. The pay streak is from eighteen to twenty inches in width, and if it holds its own or improves as the shaft goes down, Mr. Decamp will have a bonanza from the grass roots. As it is it is one of the most important strikes that has been made, on the surface, in the history of the camp.

TWO LUMPS OF GOLD.—Helena *Independent*: Bennett, of Granite county, passed over the counter of an assay office yesterday two retorts of gold, the value of which will run something over $6,000. There were 380.95 ounces in the two retorts, worth about $16 an ounce. The gold was the result of thirteen and one-half days' run of the ten-stamp mill of the Royal Gold Mining Company of Granite county, of which Mr. Bennett is the principal owner. Since the Royal started up in August, 1893, it has not been shut down over two months. In the past year it has paid $105,000 in dividends.

NEW MEXICO.

KEYSTONE MINING DISTRICT.

The Keystone mining district is on the western slope of the Culebras mountains, and is coursed by many living streams, capable of driving many stamp and saw mills. Among the more important streams are Bitter creek, Lost Trail creek and the Red river. A dense timber growth covers the mountain sides, furnishing fuel, building lumber and railroad ties. The district abuts on the east on the Costilla grant, the top of the range being the boundary established by government survey, and is quite near the camp La Belle on the grant.

The first locations in this vicinity were made in the La Belle district on the grant. But the miners were so hampered by restrictions of the grant company that last September some of the miners left the La Belle district to prospect on the other side of the Culebras range.

OREGON.

BAKER.

LEASED TO CHINAMEN.—The Archie Downie claims, near the Sumpter, have been leased by the owner to Chinamen who are to pay a royalty of $300 per week during the working season.

TO RESUME.—*Democrat:* B. N. A. McMillan, manager of the Beckwith Mining Company, is at the Beckwith mine looking after a resumption of operations on an extensive scale in the near future.

CLAIMS SYNDICATED.—*Democrat:* Fourteen of the principal placer claims along the Grande Ronde river have syndicated and it is expected that some outside parties will arrive in a few days to examine the same with a view of closing a deal for the entire lot. H. A. Burns, of La Grande, has been appointed an agent for the sale of the same.

NEW IN OREGON.—*Times:* The Company in which Judge Reid, W. W. Milner and C. O. White of Tacoma are interested, started operations at their mines near Tolo this week. The steam pumping apparatus, which furnishes a fine supply of water from Rogue river, works to perfection and inaugurates a new system of mining.

GALL'S CREEK DISTRICT.

RICH LEDGE.—Lawrence & Cameron of Gall's creek have a rich ledge, and recently had eleven tons of the ore crushed at the Lindley mill on Sardine creek, from which was obtained $4,800 in gold or nearly $440 a ton. Gall's creek is one of the richest districts in Oregon, but very few well-defined ledges have as yet been found, pockets predominating.

GENERAL SOUTHERN OREGON NOTES.—Birdsley & Co., of Kane's Creek district, have resumed piping, the late rains having brought sufficient water.

Frank Knight has traded his interest in Kuhli & Co.'s mine in Gall's Creek district for another promising ledge on Galice creek.

J. B. Dyer has bonded the Shepherd quartz ledge on Emigrant creek, and is engaged in making preparations to develop the mine.

The Homestake mine, in Woodville district, is prospecting well and work is being pushed on it.

Schrimpf Bros., of Williams Creek district, are working in ore which produces an average of $20 a ton.

Bailey & Co., owners of the Mountain Lion mine in Missouri Flat district, will soon resume work.

The boiler and engine of the Hosley mill, on the Siskiyous, were shipped by John R. Stearns last week to the Songer & Dame mine on Klamath river, which will be operated on a large scale.

James Wyatt and Scott Gall, of Sam's valley, have struck a quartz ledge on Fitzgerald mountain, which promises to be rich. Samples of the ore have been estimated by experts to assay $80 per ton.

Work has been resumed in the Anaconda mine, in Josephine county, by Mr. King and Arch Taylor, of Grant's Pass. Prospects are good. The Bone of Contention still lies idle, awaiting the return of J. C. Ezzell.

The stockholders of the Hammersly mine, in Jump-off-Joe precinct, held their annual meeting at Medford last week. Officers were elected as follows: President, G. R. Hammersly; vice-president, A. S. Hammond; secretary and treasurer, J. L. Hammersly; general manager, Riley Hammersly. Although the mine is bonded the company will work portions of it until final payment is made.

UTAH.

A PROFITABLE INVESTMENT.—*Tribune:* A cyanide gold mine and mill turning out $22,000 in fourteen days, against an expense of not more than $4000, is one of the interesting phenomena that Utah is now presenting to the mining world. To all appearances that record can be made continuously for an indefinite length of time. The people to profit by it are those lucky Nebraska gentlemen, who one year or more ago invested in the Mercur mine at Camp Floyd.

The recent article from the pen of Dan De Quille should have been credited to the Salt Lake *Tribune*.

WYOMING.

THE TAIT MINE SOLD.—A big mining sale has just been made in the Wood River country in Wyoming. The Tait mine and a few adjoining claims have been sold to some Eastern capitalists for $65,000. Of this sum $25,000 is to be paid in cash and the remaining $40,000 when the stamp mill is ready for operation. The original owners will also receive a royalty of fifteen per cent on the mill product. The mine, which is a good proposition, is situated on Franc's Fork. The lead is twenty-five feet in width and assays $6.75 free gold to the ton. The mine is situated at almost an inaccessible point in the mountain. All material and supplies have heretofore been taken in on pack animals. The new owners will build a road. It will cost $30,000 of itself. The mine is but three miles from the boundary of the Yellowstone Park.

PLACER DEAL CLOSED.—A party of Rhode Island capitalists, who visited the Dry Gulch placer district on Snake river, has closed the deal for 1500 acres of placer ground. The purchase price, including the ditch, is a little less than $120,000. The money was paid lately. They have purchased the Douglas water right, which taps the Snake river at Dixon. The contract for extending the ditch has been let to a prominent firm of railroad contractors who will ship men and teams, which were expected to arrive last Monday. A new town will be laid out at Dry Gulch, fifteen miles west of Baggs. Work will begin at once, and will be pushed with all possible speed.

ACTING Secretary of the Treasury Hamlin has decided that diamond cutting in the United States is not a new industry. Consequently the expert diamond cutters whom it was proposed to bring over from Holland to New York to ply their avocation in this country may not be admitted under the contract labor law.

IT is believed by competent judges that in times of normal prosperity the demand for all-around machinists for work on new devices and special machinery equals the curtailment of work requiring their skill in shops, due to the installation of automatic machinery which machine hands can operate equally well.

COCKROACHES are never wittingly slain by Chinamen. They consider them sacred insects, and think it portends ill luck to step on them. As they never make any effort to exterminate them, the Chinese quarters are usually overrun with these pests.

EVERY steam pipe supplying an engine should be provided with a drip close above the throttle valve, that is, if the pipe descends to the engine. If it comes below, of course, the drip will have to be from the lowest point in the steam main.

IT is said that there are millions of Chinese in the interior of China who are totally ignorant of the fact that a war has been going on with Japan.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING MARCH 26, 1895.

536,254.—DISH WASHER—E. H. Alvord, Seattle, Wash.
536,267.—BUCKLE—C. A. Conger, S. F.
536,186.—COAL BUNKER—Curtis & Isaacs, S. F.
536,376.—PIPE—R. F. Dockery, Los Angeles, Cal.
536,194.—STEAM ENGINE—W. R. Dow, Alameda, Cal.
536,465.—RAILWAYS—E. Gay, Riverside, Cal.
536,466.—VOTING MACHINE—F. H. Gilbert, Ridgefield, Wash.
536,284.—CAR COUPLING—C. W. Hinton, Los Angeles, Cal.
536,210.—SIGNAL—W. E. M. Jackson, S. F.
536,576.—SKIRT ELEVATOR—J. Mallett, Oakland, Cal.
536,226.—SEPARATOR—J. D. McKinnon, Portland, Or.
536,233.—TELEPHONE—Sabin & Hampton, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WINDMILL.—Charles A. Norcross, Reno, Nevada. No. 535,956. Dated March 19, 1895. This invention relates to certain improvements in windmills. It consists in the employment of two oppositely rotating wheels mounted close together upon the same shaft, so that the wind passing through one wheel reacts to turn the other wheel in the opposite direction; and in conjunction with this an intermediate mechanism by which the power of each wheel is transferred to a vertical driving shaft, the proportion of the mechanism being such that while the two wheels rotate at different rates of speed, the power will be applied essentially evenly to the vertical shaft. The vanes of the wheels are made by stretching metal sheets around the radial straining rods and interior to a supporting rim, the edges of which are turned around peripheral rods.

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Conducted from 1863 by its present owners (A. T. Dewey, W. B. Ewer and Geo. H. Strong), this agency has the best knowledge of patents already issued and of the state of the arts in all lines of inventions most common on this coast.

Patents secured in the United States, Canada, Mexico, all British colonies and provinces, England and other civilized countries throughout the globe.

Caveats filed, assignments duly prepared, examinations made, and a general Patent Agency business conducted.

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Electrical Progress.

An Important Enterprise in Mexico.

A most interesting and important electric-power installation is now under construction for the Cia. Anonima de Transmission Electrica de Potencia, located in the State of Hidalgo, some 100 miles north of the city of Mexico.

The water is taken from the Arroyo de Regla, a mountain stream having a minimum supply of 1500 cubic feet per minute. A natural rock dam at a point in the canyon impounds the water sufficiently to admit of its being diverted by a cut through the bluff into a canal which follows mostly the contour of the mountain—a distance of 1½ miles. This involved the cutting of seven tunnels, aggregating a total length of 1200 feet through solid rock.

From the terminus of the canal the water is carried to the power station through 1700 feet of thirty-inch pipe, which affords a vertical head of 800 feet, this being of varying thickness to correspond to the pressure at various points on the line, the lowest portion being made of steel three-fourths of an inch thick. The pipe line discharges into a receiver forty inches in diameter by seventy-five feet long, with which the wheels are connected by lateral branches. This is made of flange-steel plates three-fourths of an inch thick, tested to 700 pounds water pressure, and weighs upwards of 50,000 pounds.

The power station consists of five Pelton wheels, forty inches in diameter, of capacity of 400-horse power each, directly connected to the same number of twelve-pole, three-phase generators running at a speed of 600 revolutions, delivering the current at a pressure of 700 volts; also two twenty-four-inch Pelton wheels speeded at 1700 revolutions for running the exciters. The step-up transformers are wound for a ratio of one to fifteen, making the line potential a little over 10,000 volts at the generator end. There are three transformer sub-stations in which air-blast transformers are to be used. Pelton differential governors are attached to each wheel for the purpose of regulation.

This station is to supply power to the mines of the Rio del Monte Company—one of the most extensive mining organizations in the world, employing upwards of 8000 men. The power is to be used for operating mining machinery, such as stamp mills, crushers, pumps, hoists, ventilators, etc. The mines of this company, said to be the richest in Mexico, are located within a radius of twenty miles, the maximum distance of power transmission being twenty-three miles and the mean distance about eighteen miles. Various other mines in the vicinity will also be supplied with power from this station and the city of Pachuca also furnished with light. A market for the entire power being thus afforded at highly remunerative rates, the financial success of the enterprise is assured—in fact, it is claimed that the entire outlay, some $300,000, will be returned to the company in two years' time from the saving effected in fuel heretofore required in carrying on their various operations.

This important enterprise, involving many difficult engineering problems, originated with and is being carried to completion under the direction of Senor R. M. de Arozarena, an accomplished engineer, resident of the city of Mexico, also a director of the company.

The Pelton Water Wheel Company, of San Francisco and New York, has the contract for the hydraulic part of the work, and the Thomson-Houston International Company, of New York, for the installation of the electrical machinery. The plant is expected to be in running order in about ninety days, when some further particulars will be given as to its operation.

Considering the magnitude of the work, the extreme water pressure, the variety and extent of machinery to be operated, as well as the difficulties attending the transportation and erection of such massive machinery in a mountainous and almost inaccessible region, this may be regarded as altogether the most remarkable electric-power installation so far made in any part of the world.

The Legal Aspects of Electrolysis.

It is at the present time a well-settled fact that a continuing and serious damage is done to buried gas and water pipes and to the metal sheaths of buried telephone and other cables by the action of electricity as now generally employed by electric railway companies for propelling their cars, and, while efforts are being made to obviate the trouble, the success of the remedies proposed or their suitability for constantly changing conditions is somewhat doubtful, so long as the rails are employed as a part of the electric return circuit.

It is generally admitted that a complete remedy is found in the use of a return circuit entirely insulated from the earth, such as would be afforded by the use of a double trolley wire; but there is a natural aversion on the part of the street railway companies to such an expedient because of its expense, although it may be seriously questioned whether the deterioration or corrosion of the rails themselves, when buried in the earth and used as a return circuit, is not a source of loss whose magnitude, if fully appreciated, would virtually compel the adoption of this remedy.

The disposition, however, is to palliate the evil, if possible, by improving the conductivity at the rail joints, thereby furnishing so good a path for the return current that the amount diverted to the earth and to buried conductors will not produce a material injury. The injury arising from imperfect bonding had, however, grown to be very great before the extent of the evil had been suspected, and will continue to exist wherever the bonding is imperfectly done or where it may deteriorate.

The question arises on this general state of facts: Upon whom does the responsibility rest for the injuries heretofore accruing, or which may hereafter arise, from the corrosive action of the railway currents? This question Henry C. Townsend discusses in a very suggestive and interesting manner in the April number of *Cassier's Magazine*, analyzing the subject from an expert's standpoint and indicating what may be expected in the way of compensation from electric street railroad companies for damages resulting from their power circuits.

Electricity in the Seventies.

The rapidly growing interest of the public in things electrical is being met by a much higher standard of electrical information in the leading daily papers, and one result of this popular education is that it is by no means an uncommon thing to hear practical electrical questions discussed with much intelligence by those who have had a technical training. This is the more noticeable when the dense ignorance in regard to the phenomena of electricity which reigned outside of professional circles not many years ago is considered. C. F. Brush, who is well known as one of the pioneers of electric lighting in this country, recently told a convention of the National Electric Light Association something of his experience in 1878, when the first arc-lighting machine was started in Cincinnati. The light was exhibited from a balcony on one of the principal streets. It was a 4000 candle light, and, of course, it attracted a large crowd of the natives. A singular point about the crowd was that every man in it seemed anxious and ready to tell his neighbor all about the wonderful new light. One man collected quite an audience about him. He called attention to the solenoid at the top of the lamp. "That," he said, "is the can that holds the oil;" and speaking of the side rod of the lamp, "that is the tube which conducts the oil from the can to the burner." He said nothing whatever about electricity, but the oversight was not noticed by his hearers. One of the earliest lighting machines was about the same time taken to Cleveland, where it was shown in operation to a number of invited guests by a local engineering firm.

One of the guests looked the whole apparatus over very carefully for about half an hour, and then, pointing to the line wire, said to Mr. Brush: "How large is the hole in that wire that the electricity flows through?" Another spectator, who was connected with the company in whose works the machine was being shown, watched its operation for about five minutes in silence. By that time he had digested the whole thing and was ready to tell Mr. Brush all about it. He said: "The electricity in that thing is generated by that revolving business there, rubbing the air up against these iron blades (meaning the field magnets) just as you get sparks when you rub a cat's back." Mr. Brush ventured to remark that, while that might be a good theory, it did not fully meet the facts. The objection was promptly put aside: "The whole thing is plain. If you should run that machine in a vacuum, where there is no air, you could not get any electricity." Mr. Brush related another incident illustrative of the vagueness of the popular ideas of electric light in the pioneer days. When the first commercial arc lights were installed in Cleveland, the "tower" system was used. Twelve lights of the so-called 2000 candle power were massed on the top of high ornamental poles in the Public Square. At the first illumination the little park was packed from side to side, and many of the people, in expectation of a blinding glare of light, had provided themselves with colored spectacles or smoked glass.

Electrical Terms.

People read every day about volts and amperes without understanding in the least what they mean. A prominent legal cross-examiner makes this clear, and he does it by telling of the question he put to Mr. Thomas A. Edison in the witness-box one day. Here is the question, and Mr. Edison's answer:

Q. "Explain what is meant by the number of volts in an electric current?"

A. "I will have to use the analogy of a waterfall to explain. Say we have a current of water and a turbine wheel. If I have a turbine wheel and allow 1000 gallons per second to fall from a height of one foot on the turbine, I get a certain power—we will say one-horse power. Now, the one foot of fall will represent one volt of pressure in electricity, and the 1000 gallons will represent the ampere or the amount of current; we will call that one ampere. Thus we have 1000 gallons of water or one ampere, falling one foot or one volt, or under one volt of pressure, and the water working the turbine gives one-horse power. If, now, we go 1000 feet high, and take one gallon of water and let it fall on the turbine wheel, we will get the same power as we had before, namely, one-horse power. We have got a thousand times less current or less water, and we will have a thousandth of an ampere in place of one ampere, and we will have 1000 volts in place of one volt, and we will have a fall of water 1000 feet as against one foot. Now the fall of the water, or the height from which it falls, is the pressure or volts in electricity, and the amount of water is the amperes. It will be seen that 1000 gallons a minute falling on a man from a height of only one foot would be no danger to the man, and that if we took one gallon and took it up 1000 feet and let it fall down it would crush him. So it is not the quantity or current of water that does the damage, but it is the velocity or pressure that produces the effect."

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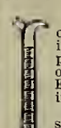

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Timhering in Mines.

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New Remedy for Insomnia.

An expert in nervous disorders in Paris recommended to an American gentleman a cure for insomnia which was tried with such success that the patient has prescribed it to many of his friends. It is simply to keep your eyes open when you want to go to sleep and cannot. A person whose brain is too active will sometimes close the eyes and vainly endeavor to sleep. The very closing of the eyes seems to concentrate the mental faculties on business affairs and other distractions. The theory of the French physician is that if the victim of insomnia will fix his eyes upon some gleam of light, some shadow, or even on the darkness itself, he can relieve his mind from thoughts that perplex it and divert attention from himself. Try the experiment when you are sleepless and see how unconsciously your eyes will close and your thoughts begin to take possession of you. Struggle to keep them open and fixed upon an object, either real or imaginary, and before you are aware of it the struggle will have ended and sleep will be victorious.

A Long Life.

Sir Benjamin Richardson, M. D., of England, thinks that the normal period of human life is about 110 years, and that seven out of ten average people could live that long if they lived in the right way. They should cultivate a spirit of serene cheerfulness under all circumstances and should learn to like physical exercise in a scientific way. No man, he says, need be particularly abstemious in regard to any article of food, for the secret of long life does not lie there. A happy disposition, plenty of sleep, a temperate gratification of all the natural appetites, and the right kind of physical exercises, will insure longevity to most people.

COMMON salt is one of the most valuable remedial agents the world contains. Used as a tooth powder, alone or with a little prepared chalk, it whitens the teeth and makes the gums hard and rosy. It is a good gargle for sore throat, and if taken in time will benefit, if not cure, diphtheria. It will stop bleeding of the mouth, and in warm water is a good emetic and remedy against several poisons. There is nothing better for sore feet and hands than salt and water, and for ordinary sore eyes, though a painful application, it will often effect a complete cure.

GEORGE T. COMINS, the manager of the Beecher Falls, Vt., mill, on the U. S.-Canada line, relates an amusing story illustrative of the contract labor laws. It seems that the company's logs are stacked up in tiers about three feet apart on both sides of the line. One day recently the foreman was standing on one of the piles when a man approached and asked him if he wanted to hire any help. He replied that he did not, at the same time stepping over to the next pile. The man followed him, when the foreman turned and said: "When do you want to go to work?" "I thought you didn't want to hire anybody," said the man. "I was in Canada then," the foreman said, "and liable to a fine of $1000.

THE peculiar accident to the steamer Venetian, near Boston, by which the vessel was broken in two in the middle, suggests again the danger of great length in metal ships. There seems to be a lack of what might be termed longitudinal strength in vessels made of plates of iron or steel. The strain to which the craft is subjected when raised upon a wave is hardly less than that to which the Venetian succumbed.

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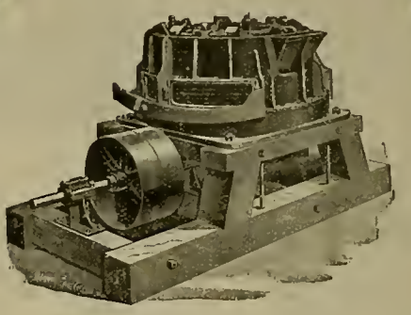

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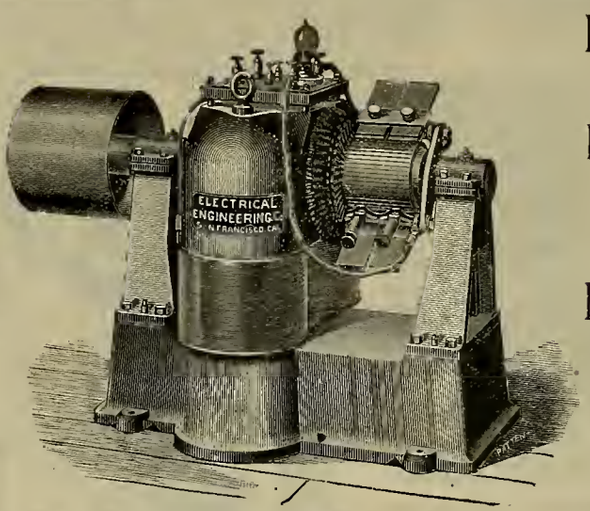

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Market Reports.

The Markets.

SAN FRANCISCO, April 4, 1895.

The advance in silver during the week attracted universal attention. Monday's price was 68 cents an ounce—the highest since Jan. 20, '94. Possibility of favorable legislation, the proposed hi metallic conference, and the expectation of sudden demand for considerable quantity of silver in the case of the Chinese indemnity, were among the causes for the rise, which cannot he considered other than a spurt, the speculative character of the advance not warranting any assumption of permanence or tangible effect in the settlement of the great question. The advance has been the occasion of justly joyful comment all over the west half of America. It is very likely that were the price to advance to 70 cents a large number of idle silver-producing properties would resume work.

Every three months the Treasury Department fixes the import value of foreign coin for the ensuing quarter; this time the quarterly value was announced just before the little "hoom" in silver, with the curious result that while Mexican dollars are quoted 54@55 cents, the official valuation is $0.479. Importers of Mexican dollars will not he slow to take advantage of the situation.

New York Metal Market.

NEW YORK, April 4.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.
COPPER—Brokers', 9.37½c; exchange, 9.40c.
LEAD—Brokers', $3.05; exchange, $3.12½.
TIN—Straits, 14.20c.
SPELTER—Domestic, $3.20.

New York Silver Prices.

NEW YORK, April 4.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	29¼	64	9 40	
Saturday	29¼	65¼	9 35	3 12½
Monday	30⅛	67¼	.....	.....
Tuesday	30¼	66⅞	.....	.....
Wednesday	30⅜	66⅛	9 37½	3 12½
Thursday	30	65¾	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	7½c
New York Telegraphic Transfer	10c
London Baukers' 60 days	$4.88¼
London Merchants	$4.86
London Sight Bankers	$4.89¾
Refined Silver, per ounce	65¾c
Mexican Dollars, nominal	54½@55

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lh	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per hx	5 25	@	6 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lh	14	@	16
NAILS.			
Wire			$2 90
Cut			2 65
PIG TIN.			
Per lh	15	@	16 00
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pips	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per hag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL. SPOT FROM YARN—PER TON.			
Wellington			$ 8 00
Greta			7 75
Nanaimo			6 50
Gilman			6 00
Seattle			6 25
Coos Bay			6 00
Cannel			10 50
Egg, hard			13 00
Wallsend			7 50
Scotch Splint			7 75
Brymbo			7 75
West Hartley			8 75
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	11 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'			75c ₱ bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER. SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Prof. Virchow, the eminent German pathologist, has affirmed his belief that no trace of "the missing link" between man and the lower animals has been discovered, either in the physical structure of modern savages or in the human skulls which are believed to be the most ancient.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Belcher S M Co, Nev	50	25c	Mar 5, Apr 9, Apr 30	C L Perkins, 309 Montgomery
Booth G M Co, Cal	5	2c	Feb 18, Mar 25, Apr 17	Geo R Spinney, 310 Pine
Brunswick Con G M Co, Cal	8	2c	Mar 20, Apr 20, May 15	J Stadtfeld Jr, 309 Montgomery
Bullion Con G M Co, Cal	1	10c	Feb 19, Mar 25, Apr 25	C A Grow, Mills Building
Challenge Con, Nev	18	5c	Feb 19, Mar 26, Apr 16	C L McCoy, Mills Building
Con New York, Nev	13	5c	Feb 19, Mar 26, Apr 17	Chas E Elliott, 309 Montgomery
Crown Point G & S M Co, Nev	65	25c	Mar 12, Apr 16, May 7	Jas. Newlands, Mills Building
Eureka Con, Nev	13	25c	Feb 19, Mar 25, Apr 11	H P Bush, 134 Market
Granite G M Co, Cal	2	1½o	Jan 2, Mar 9, Apr 6	Wm Schaw
Gray Eagle M Co, Cal	39	5c	Mar 2, Apr 8, Apr 26	A P Swain, 309 Montgomery
Iowa M Co, Nev	20	5c	Mar 6, Apr 9, Apr 27	R L Thomas, 419 California
Julia Con M Co, Nev	26	5c	Feb 13, Mar 20, Apr 10	J Stadtfeld, Jr., 309 Montgomery
La Candelaria M Co, Mex	8	$2	Mar 7, Apr 9, Apr 27	G A Hill, 22 Market
La Grange H M Co, Cal	10	35c	Feb 23, Apr 1, Apr 22	A Halsey, 328 Montgomery
Occidental Con M Co, Nev	18	10c	Mar 20, Apr 23, May 15	A K Durhrow, 309 Montgomery
Osborn Hill G M Co, Cal	4	25c	Feb 27, Apr 4, Apr 24	R R Grayson, 331 Pine
South Eureka M Co, Cal	17	1c	Feb 20, Apr 1, Apr 22	A Halsey, 328 Montgomery
Starlight Mining Co, Cal	5	10c	Feb 11, Mar 18, Apr 8	H R Williar, 214 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Champion M Co, Cal	J F Holling, 113 Crocker Building	April 9
Bulwer Con M Co, Nev	J E Jacobus, 309 Montgomery	April 10

Mining Share Market.

SAN FRANCISCO, April 4, 1895.

The rise in silver or something else favorably affected Comstock shares during the week, and there was a general advance.

Following is a statement of the cash balances of mining companies last Monday.

BODIE MINES.			
Bodie	$ 5,990	East Sierra Nev.	$135
Bulwer	296	Exchequer	2,399
Mono	3,766	Gould & Curry	12,331
Standard	37,995	Hale & Norcross	14,341
Syndicate	787	Julia	1,536
WASHOE MINES.		Justice	2,205
Alpha	$5,197	Kentuck	3,032
Alta	5,284	Lady Wash'n	1,922
Andes	4,374	Mexican	11,082
Belcher	5,449	Ophir	1,766
Best & Belcher	6,932	Overman	4,776
Bullion	8,316	Occidental	307
Caledonia	3,110	Potosi	17,795
Challenge	1,981	Savage	3,190
Chollar	5,945	Scorpion	847
Con. Cal & Va	68,414	Seg Belcher	7,990
Confidence	6,890	Silver Hill	1,273
Con. Imperial	716	Sierra Nevada	19,187
Con. New York	1,647	Union Con	11,545
Crown Point	608	Utah	1,706

The Golden Eagle is in debt $7481.46, and the Summit $533.35.

Sales at the regular session of the San Francisco Stock and Bond Exchange Board for the month of March were 286,530 shares. For the first three months of the year they were 737,545 shares, as against 730,000 shares during the same period last year.

At the delinquent assessment sale of the Seg. Belcher Mining Company 2575 shares were sold for non-payment of assessment.

At the delinquent assessment sale of the Justice Mining Company 1188 shares were sold for non-payment.

The North San Juan Gold Mining Company of Nevada has levied an assessment of 12 cents per share, delinquent May 6.

The Gold Point Consolidated Gold and Silver Mining Company of Nevada County has levied an assessment of five cents per share, delinquent May 1.

Next week the Bodie mill will begin crushing an accumulation of ore from the Bodie Consolidated mine.

An assessment of twenty-five cents per share has been levied on the Ophir.

The following illustrates the changes of the week:

MINES.	28	4
Alpha	.....	.....
Alta Consolidated	.....	$ 29
Andes	$ 27	.....
Belcher	40	42
Best & Belcher	.....	82
Bodie	.....	1 40
Bullion	21	22
Challenge	45	44
Chollar	49	58
Confidence	1 50	.....
Consolidated California and Virginia	2 70	2 80
Consolidated New York	.....	.....
Crown Point	42	42
Exchequer	03	04
Gould & Curry	48	52
Hale & Norcross	1 20	1 40
Justice	17	16
Mexican	81	84
Ophir	1 60	1 65
Overman	.....	.....
Potosi	.....	58
Savage	38	39
Sierra Nevada	80	83
Union	.....	54
Utah	.....	08
Yellow Jacket	57	61

San Francisco Stock Board Sales.

SAN FRANCISCO, April 4, 1895.

9:30 A. M. SESSION.

550 Belcher	42	100 Justice	16
100	41	100 Mexican	84
100 Bodie	1 35	100 Mono	28
300 Bulwer	20	400 Ophir	1 65
100 Chollar	58	400 Potosi	58
50 C. C. V.	2 80	200 Savage	39
200 Crown Point	42	200 Sierra Nevada	83
500 Exchequer	04	300 Union	54
100 Eureka	35	300 Utah	08
300 Hale & Norcross	1 40	300 Yellow Jacket	61

SECOND SESSION—2:30 P. M.

100 Alta	29	200 Con Cal & Va	2 70
100	28	300 Gould & Curry	52
450 Belcher	41	500 H & N	1 30
100	42	200	1 35
20	40	250 Mexican	83
400 Best & Belcher	82	200 Ophir	1 60
100 Bodie	1 40	1050 Potosi	55
100 Bullion	22	200 Savage	37
200 Bulwer	19	550 Sierra Nevada	82
100 Challenge	44	300 Union	53
100 Chollar	55	200 Yellow Jacket	58
100	56	100	57

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THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from David Croft, in the Gold Deposit mine, near Kelsey, El Dorado Co., to deposit tailings in an old hydraulic pit; from Wm. F. Coe, in the Railroad Placer Mine, near Placerville, El Dorado Co., to deposit tailings behind dams in Spanish Flat Ravine; from J. C. Day, in his mine near Georgetown, El Dorado Co., to impound tailings in an old hydraulic pit; from John A. Browles, in the Independence Mine, near Brownsville, Yuba Co., to impound tailings behind a dam in Letson Ravine; from Wm. Henning et al, in the Iowa Mine, near Forest Hill, Placer Co., to impound tailings behind a dam in a ravine; from Jas. Ward & Wm. McDonald, in the Tiger Mine, near Forest Hill, Placer Co., to impound tailings behind a dam in a ravine; from Jos. J. Hoffman et al., in the Hard Times Mine, Bath, Placer Co., to impound tailings in an old hydraulic pit; and from Wm. & Wm. J. S. Bacchi, in the El Dorado Placer Mine, Garden Valley, El Dorado Co., to impound tailings in ravine below the mine, gives notice that a meeting will be held at Room 92, Flood Building, San Francisco, on April 22d, 1895, at 1:30 P.M.

THE CALIFORNIA DEBRIS COMMISSION having received an application to mine by the hydraulic process from George Wheeler, in the Grizzly Flat Mining Claim, El Dorado county, Cal., to impound tailings behind brush dams below the mine, gives notice that a meeting will be held at room 92, Flood building, San Francisco, Cal., April 1, 1895, at 1:30 P. M.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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Must he in good condition and of late pattern.
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Having renewed our contract on more advantageous terms with Mr. S. Kendall for the manufacture of his Patent Quartz Mill, we are enabled to offer these mills at Greatly Reduced Prices. Having made and sold these mills for the past 14 years, we know their merits, and know that they have given perfect satisfaction to purchasers, as numbers of commendatory testimonials prove. We feel confident, therefore, that at the prices we are now prepared to offer them, there is placed within the reach or all a light, cheap and durable mill that will do all that is claimed for it and give entire satisfaction.

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Coast Industrial Notes.

—The Paraffine Paint Co. has paid its regular quarterly dividend of 25 cents per share.

—Charles F. Martin, at 223 Mission street, has had granted to him a patent on a flying machine, on which he has been working for two years.

—W. P. Fuller & Co. have finally quit fighting the Standard Oil combine, and coal oil, gasoline, etc., have advanced one cent a gallon. The coast consumes about 20,000,000 gallons annually.

—The fact that there is a grain of gold in every ton of sea water impels a Colorado corporation, called the Carbon Precipitating Co., to establish works at San Diego to secure gold from the waters of the Pacific ocean.

—Everett, Wash., expects soon to see work begin on a new whaleback. Estimates on the earnings of the whaleback City of Everett show a net profit of $5000 a month. This would provide for 20 per cent yearly dividends and pay for the boat in five years.

—Hall Bros. are building three four-masted schooners at Port Blakeley, Wash., each to be about 3000 tons burden, with a carrying capacity of 700,000 feet of lumber, and costing $40,000. This firm has now built eighty different vessels of fir and with universal satisfaction.

—T. W. Jones is at Newcastle, Placer Co., in charge of the work of putting in an electric light plant for the South Yuba Water Company. The dynamo house will be erected on the hill, a mile from town. The plant will furnish light for Newcastle, Penryn and Rocklin.

—The Sloss-Wasserman trial in progress reveals the enormous dividends made by the Alaska Commercial Company out of its sealing contract. Dividends amounting to $800 on every $100 share were paid for five years. The firm had millions on deposit, acquired by the capture of seals. Sloss bought some of the shares from Wasserman for $60 each.

—The work of grading on the narrow gauge railroad from Carbondale to Amador has begun. It is claimed the work will be pushed through to completion as soon as possible. It is announced as the intention to have this road connect with Jackson, Sutter Creek, Amador City, Plymouth and other towns on the mother lode, and be extended up into the timber region in the Sierras.

For the first time a carload of flowers was, last Wednesday, shipped to the East by freight from Los Angeles, via the Santa Fe, to Chicago, where the blossoms will be used in Easter celebrations. The shipment will make the trip in six days, going on a fast fruit train. The shipment comprises, among other items, one of 30,000 Calla lillies and several thousand caruations. Lilies can be landed in Chicago for between $6 and $7 per thousand and will bring $50.

—The San Joaquin Electric Company incorporated this week at Fresno, with a capital stock of $800,000. The incorporators are J. J. Seymour, O. J. Woodward, J. S. Eastwood, James Porteous, W. R. Madary and L. L. Levy. The company proposes to construct a dam eighty feet high on the San Joaquin river, near the mouth of Fine Gold creek, thirty-two miles east of Fresno, and utilize the power for electric lighting and motor purposes.

—Preparations for the opening of the Columbia river salmon-packing season are complete. On April 10th nearly every cannery on the Columbia river from The Dalles to Astoria will present a scene of activity. Packers generally are anticipating a good run of fish, and, as the market demand is steady at last year's prices, they are ready to stow away every chinook that can be had. The season will open with a rush, and the rush will continue right through the next three months.

—Mr. C. C. Howell, the manager of the Sacramento Industrial Improvement Association, says that under arrangement with the Sacramento Electric Light and Power Co., an electric current equivalent to 10-horse power will be furnished a manufacturer in that city for $587.20 a year, or $47.93 a month, for ten-horse power, ten hours a day, for twenty-six working days a month and twelve months in the year. If this is so, there is no other place in the country where power can be secured so cheaply.

—A new steamer line from Portland to Japan is announced. The O. R. and N. Co. have an agreement with Samuels, Samuel & Co., of Yokohama, and others, to place two steamers on the route, making monthly trips. The first steamer leaves Hong Kong the 1st of May. The first steamer leaves Portland June 1st. All steamers will run via Yokohama and during the winter months via Honolulu. The vessels are to have a carrying capacity of from 3000 to 5500 tons. The line is to be operated in connection with the O. R. and N. Co. exclusively.

—The high price of fuel makes manufacturers look with interest at the possibilities of southern California oil wells, and desirous of investigating the renewed project of transmission of power from Clear Lake, 73 miles from here. Engineers, who have given the matter considerable attention, say 75,000-horse power can be developed. It is now proposed to transmit 5000-H. P. to Benicia, and the possibility of transmission across the bay from Oakland is under discussion. That the successful solution of the question would greatly simplify the fuel problem, which is really the power problem in this city, is manifest.

—The failure of the Canadian Pacific railway to pay dividends on its common stock is not a surprise to those who have known that the Canadian Government has for years loaned to this company the money for dividends. All this time the debt of Canada has been growing, but it was supposed that the mortgage on the property and bonds of the railroad would prove a good security. For a while, in years of its prosperity, it is probable that the dividend was earned. Money was also raised by the issue of new stock, ostensibly to pay for new lines and equipments. Part of this money went to pay dividends. The last three years the earnings of the company steadily declined. In 1892 they were $21,400,000. In 1893 they were only $20,362,000, and last year there was a drop to $18,700,000. From 1884 to 1893 the capitalization of the the company increased from $100,000,000 to $177,000,000. The dividends on the stock were guaranteed by the Dominion Government from 1883 to 1893, and with the expiration of the guarantee the dividends ceased. The railroad has been the chief backer of the MacDonald and the Thompson administrations. If the Liberals come into power, as they are likely to do, the road will not further involve the people of Canada in debt. The Canadian debt in 1870 was $173,000,000, but in 1889 it was $286,000,000, and on June 30, 1893, it had increased to $300,000,000. This is about $60 per head for man, woman and child. The debt is increasing, while emigration to the United States makes the Canadian increase in population very slow. At least 1,000,000 natives of Canada are now living in the United States.

ALUMINUM is found to be not suitable for a great many of the uses to which it was to be put.

Assessment Notices.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Grass Valley Mining District, Nevada County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 20th day of March, 1895, an assessment (No. 8) of Two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, Nevada Block, San Francisco, California, or to the Treasurer, F. J. Halpin, 57 Broadway, room 87, New York City, State of New York, on or before the 20th day of April, 1895.

Any stock upon which this assessment shall remain unpaid in San Francisco, on the 20th day of April, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD Jr., Secretary.

Office—Room 56, Nevada Block, San Francisco, California.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 20th day of March, 1895, an assessment (No. 18) of Ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 23d day of April, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

IOWA MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia City, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of March, 1895, an assessment, (No. 20) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 2, 419 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of April, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on SATURDAY, the 27th day of April, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. L. THOMAS, Secretary.

Office—Room 2, 419 California Street, San Francisco, California.

DELINQUENT SALE NOTICE.

BOOTH GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Auburn, Placer County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 5) levied on the Eighteenth day of February, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amt.
Richard Chenery, Trustee	160	6,275	$125 50
Richard Chenery	17	5	10
Thomas Day, Trustee	148	500	10 00
Thomas H. Gordon, Trustee	68	1,000	20 00
Thomas H. Gordon, Trustee	112	100	2 00
Thomas H. Gordon, Trustee	114	100	2 00
Thomas H. Gordon, Trustee	116	100	2 00
Thomas H. Gordon, Trustee	117	100	2 00
Thomas H. Gordon, Trustee	118	100	2 00
Henry Gilman	28	300	6 00
Henry Gilman	175	1,000	20 00
E. S. Harrison, Trustee	177	1,000	20 00
J. W. Winter, Trustee	161	250	5 00

And in accordance with law, and an order of the Board of Directors, made on the Eighteenth day of February, 1895, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the salesroom of S. P. Middleton & Co., No. 30 Montgomery Street, San Francisco, California, on WEDNESDAY, the Seventeenth day of April, 1895, at the hour of Two o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

GEO. R. SPINNEY, Secretary.

Office—310 Pine Street, Room No. 28, San Francisco, California.

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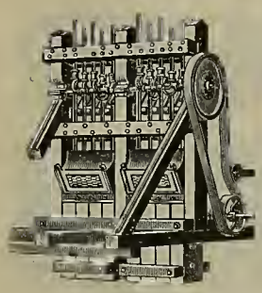

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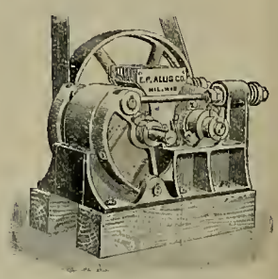

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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 15.

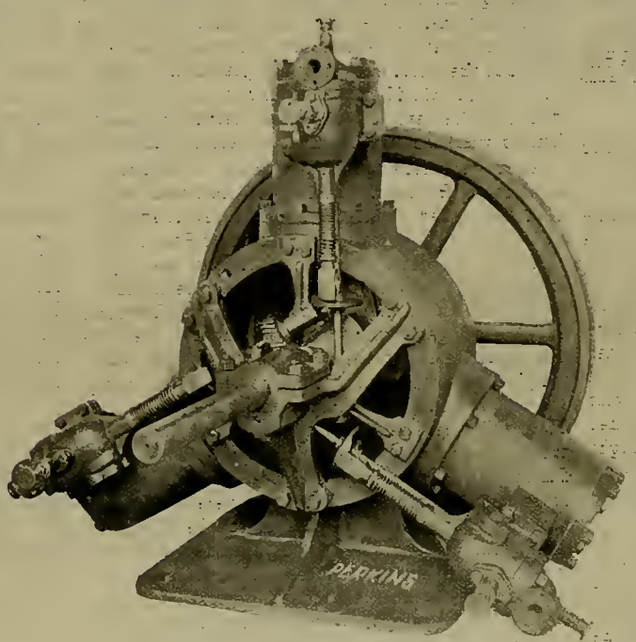
SAN FRANCISCO, SATURDAY, APRIL 13, 1895.

THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Cal. State Library APR 13 1895

A Very Big "Boom."

A California mining man now in London writes that no one not on the spot can form adequate idea of the present craze in the British metropolis for South African mine shares and at absurd prices. He says that every shopkeeper is buying, in many instances realizing on valuable securities to put money into the most inflated schemes. The "Kaffir Circus," as it is called, is a present popular investment, and staid and respectable Britons talk of the "boom" and buy shares in real and fanciful mining propositions that as a matter of airy speculation beat anything ever heard of on this coast. The London *Mining Journal*, an old and conservative concern, has as "boomy" and airy a tone as ever was evinced in the local columns of a Nevada paper in the old days when Con. Cal. and Va.'s 108,000 shares were split up into 540,000, and each one paid a monthly dividend of $2. In the issue of that paper to hand, dated March 16th, it says in a leading editorial: "It is impossible to dismiss the movement contemptuously as a 'mining boom,'" and argues that the Rand has "an even more wonderful future," and that "the glowing forecasts of a few years ago are feeble underratings of the facts which seem to be established by later developments." And so on. This old and influential journal thinks that even the blocks of stock now being dealt out to French investors at "way up" figures will be soon bought back by English capitalists "at enhanced values," and that Rand mine properties will go to twice their present valuation. Perhaps so. When a usually conservative mining paper like the *Journal* editorially believes that, it is not strange that every one in London with a few spare pounds in his pocket should be falling over each other in a mad rush for stock in the South African mines. Meanwhile we must differ from our esteemed British contemporary in its belief that the present wild purchase is not "speculation." If it isn't, then what is "speculation"? Without at all questioning the acknowledged value of some South African gold properties it is as certain in this instance, as it has always been in every other similar instance, that a good many good people will be fooled into buying worthless stock, and that the inevitable reaction will injure the placing of legitimate mining enterprises located in South Africa or, in fact, anywhere else.



PERKINS TRIPLEX GAS ENGINE.

Borax.

Like some other California productions the borax industry is not particularly active just now. The borax deposits in this State and Nevada have been worked for the past twenty-three years, a vastly larger proportion of the total production being from California borax marshes and beds during the past four years. The different borax companies have derived nearly all their product from "marshes." Near Daggett, in San Bernardino county, borate deposits of an entirely different character have been partially developed, being found in hard, dry, stratified masses among sedimentary rocks. In the southern part of Inyo county, borates of lime and soda are being worked at Salt Wells valley. Cuts of the works and of the team used in hauling from the mine thereto, typify the desolate desert character of that region.

Perkins Triplex Gas Engine.

The accompanying cut illustrates an original departure in construction and operation from the ordinary form of marine gas engines, its object being to attain high speed and great power within limited space. This is accomplished by frequent explosions within the three cylinders giving such rapid and successive play upon the crank shaft as to constitute an almost unbroken explosive action. By this means the engine is started with great ease, maintaining a steadier and more uniform motion than any other engine of this class, and equaling, it is said, that of steam. While its compactness and steadiness peculiarly fit it for marine uses, it is also especially adapted to operating dynamos for lighting or other purposes. The subject of the accompanying illustration was built on a special order for Commodore Leonard's sloop yacht "Dream," as an auxiliary to sails. It occupies but four feet of space in any direction and develops eight H. P., with working revolutions of 300 per minute. The construction and operation is simple and economical, and as a marine type of gas engine it will doubtless prove a success and come into general use. This engine was built from the designs of Mr. Paul B. Perkins, of the Perkins Pump and Engine Co., 117 Main St., S. F.

BORAX TEAM.

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J. F. HALLORAN.....General Manager

San Francisco, April 13, 1895.

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SIMULTANEOUSLY with silver, cotton, wheat and corn have risen in price in the last three weeks.

TO TALK OF "hard times" is no longer fashionable in the East. The habit continues largely from force of habit, elsewhere.

DENVER PAPERS say that the Mining and Industrial Exposition to be held in that city will be a sure success. It ought to be, and no State will be better pleased thereat than California. Colorado miners have shown good grit, and in developing the gold properties of the Centennial State have turned disaster into victory. The proposed exposition ought to be a grand thing for that commonwealth and result in an enhancement of its general prosperity.

THE possible appreciation in the price of silver to a figure approximating old-time quotations means more to the State of Nevada than to any other mining community. The other States and Territories have developed gold wealth since the slump in the sister metal, but the Silver State has thus far been unable to show the possession of gold ore to anything like the extent necessary to redeem its prosperity from the blight put upon it by the drop in the price of its staple product.

THERE is an unusual movement among gold prospectors, and thousands of men are exploring in every direction. Eastern and southern Oregon, northeastern Washington, central Idaho, the upper Pend d'Oreille, Trail Creek, and north of the Colville reservation, to the headwaters of the Skagit, and coastward along the Alaskan line toward the Arctic circle, an army of men is scattered through the northern country. Throughout the long clear summer the million square miles northward from the California line and eastward from the coast to Lon. 104° W., will be traversed. The lower tier embracing this State, Nevada, Utah, Colorado, Arizona and New Mexico have seen equal activity for the past two years, some of the present best producing claims being the result, and '95 gives promise of greater measure of success. Profitable prospecting will be done even in this State for many years to come. There are mineral areas in California which have never been thoroughly prospected. For there is prospecting and prospecting. The horseback prospector who, with a mounted party, "traveled all over that country ten years ago and saw nothing worth stopping for," is usually heading for somewhere else. Riding through a region is not prospecting it. Men may travel through a section and afterwards condemn it, though they never dug a five-foot hole in any one spot. Wandering around is not prospecting, though there is a nomadic streak in every prospector, he being ever ready to seek new sources of wealth, which is usually enjoyed by some one else.

Platinum Production.

The increasing demand for platinum, more especially in the manufacture of incandescent electric lamps, gives great importance to this metal and its sources of supply. It is widely diffused, being found in almost every mining region in the world, usually minutely disseminated in serpentine rocks or their debris, but only in the Ural mountains, Russia, does it occur in grains, and only in those mines is it thus secured in any considerable quantity with accompanying profit. In Brazil and Colombia, South America, Sinaloa Mexico, various counties in this State and Oregon, and other localities on this continent, native platinum occurs, almost invariably in gold sand or gravel. So far as known, no determined effort has been made in California to mine it, though the continued advance in its price and the occurrence of the metal in so many instances suggest the possible profit of such enterprise. Thirty years ago platinum was quoted at $4.50 an ounce; it steadily appreciated in price till "a corner" in '89 sent it up to $17.50 an ounce. That enormous figure of course occasioned tremendous activity, and three years ago the price went down to $7.50 an ounce. Since that there have been the usual rebounds and reactions that have affected everything made or mined in the world except gold; platinum is worth to-day about $10.50 an ounce, and it is not likely it will ever be less, as the practical supply seems limited while the demand must necessarily increase.

About ten years ago placer miners on the Similkameen river, British Columbia, were bothered with a stuff they called "white iron" and threw it away, as valueless. The MINING AND SCIENTIFIC PRESS investigated the subject, with the result that the apparently worthless by-product was found to be platinum. As usual it was in placer ground, but Prof. Dawson's explorations gave color to the assumption that the belt of diorite cut by the stream at the point where the platinum was found was the matrix of that metal, and that it would be found in place, while Blake, Van Cotta and others held that it was only an incideutal product from debris of serpentine or peridote. The Tulameen Improvement and Hydraulic Company was subsequently organized and active operations prosecuted, hydraulicking the placers of the Tulameen river with varying result. Of late that company has done little, but will resume active work this season. On the 12th of last month the corporation increased its capital stock to 500,000 shares, and is now about putting on a large force. The water of Eagle creek will be utilized, a flume and ditch carrying the water therefrom to the placer grounds. In this instance, as in all others except in Russia, gold is the principal inducement, the platinum output being but incidental. On the Demidoff estate and the government Goro-Blagodat district, in the Ural mountains, platinum is mined for itself alone. It is found in a ten-inch "streak" of sand resting upon a serpentine bedrock at a depth varying from ten to forty feet from the surface. A shaft is sunk to the bedrock, a drift run and the sand hoisted, fed with water into a revolving conical screen and sluiced. The industry furnishes employment to about 6000 men and women, the former earning about 60 cents, the latter 35 cents per day, this low wage being a part of "the European level" regarding which the California miner and manufacturer hear so much nowadays. The cost of washing these Ural platinum sands is about $16.75 per kilo of native metal, about forty cents per metric ton of sand washed. It is said that sand containing less than three grammes of platinum per ton cannot be profitably handled. The average is about four grammes per metric ton. On this there is a government tax of three per cent.

It is believed that the present annual consumption of platinum in electrical and other industries in this country approximates 50,000 ounces, nearly all of which is imported. It is found in connection with iridosmine in Butte, Plumas, Siskiyou, Trinity and Tuolumne counties in this State, and its great present value (about one-half that of gold) gives it proportional importance.

REGARDING the Mother Lode Power Co., referred to on page 229, one of the incorporators informs us that the capacity will be 3000 H. P., which can be furnished at about one-half the present rates.

That Amendment Again.

Immediately after the popular majority at the last State election for the constitutional amendment regarding alien ownership of real estate in California, came numerous inquiries to this paper from England regarding its effect upon foreign investments in mining property here. The question was answered, in effect that the intent of the law was all right; that subsequent Legislatures and State courts would undoubtedly construe it in accordance with such intent, and that the adoption of the amendment need not militate against any contemplated mining investment. The London *Times* and other leading British journals have given space to adverse comment on the new California law, which has had a bad effect on the proverbially timid capitalist. It is worth while to restate the facts. The new law vests in the State Legislature the power to legislate upon the real estate rights of alien residents. That is all there is to it. Of course, there is a possibility that future State Legislatures may do foolish things as well as many wise ones; but there is no probability that there will be any interference with aliens or foreigners, resident or non-resident, in acquiring, holding or disposing of mining properties in this State. The intent was and is to prevent foreign syndicates securing great areas of State land for speculative purposes, which has been done to the detrimeut of the commonwealth in other States of the Union. Its possible application to gold-mining properties was unthought of and is remote.

As to questions of policy, this paper does not believe that the gold-mining industry of the State is greatly concerned about the matter either way. While California is to-day the best field for foreign or domestic investment in gold mines, and while the State is always pleased to have the favorable attention of capitalists, native or alien—for money talks in all languages—yet the acquisition of valuable gold-producing property by other than residents of the State or Nation is not always a wholly desirable result, so far as the State is concerned, and the State has no apologies or excuses to make for evincing a desire to preserve its domain from the grasp of what in Europe is unfavorably known as "absentee ownership," with all that that implies. The foreigner who contemplates a mining proposition in this State may be assured that nothing has been nor is likely to be done to impair justly acquired title or interfere with possession or right of transfer.

THE critical care with which every line in this paper is read, and the general character of its circulation, have been strikingly illustrated by a slight slip in the wording of a recent advertisement, which unintentionally made an indirect statement that could not be borne out by strict construction of existing facts. Like a circle widening in the water for the first few days after the appearance of that particular issue of the paper came inquiry, comment and criticism from readers round about the city, then from the interior, and from States and Territories north, east and south, and later on from more remote readers. The work of acknowledging the receipt of so many missives from every part of the mining world was lightened by the consciousness that no statement or anuouncement in any department of the paper was overlooked by our thousands of weekly readers. The circumstance is recalled and emphasized by the receipt of nine letters this week regarding a six-line item that appeared on the first page of the issue of March 23rd, regarding the cost per ton of ore treated at the West Australia works of the Broken Hill Proprietary Co. Doubt had been expressed as to the accuracy of figures quoted, and each one of the nine had information and data on that subject, referring to the little item in question. We shall probably hear from that for the next ninety days. There are few places where mining is carried on that this paper does not reach, and it is believed that there is no paper which is read with more intelligent interest.

WITH considerable surprise *Industries and Iron* of London editorially notices that a contract "for 250 tons of wrought iron, inteuded for London, has been placed in Pittsburg, U. S. A., a firm in that city having succeeded in cutting out every home estimate for the order."

Concentrates.

THE *Register* says Butte county mines yield $1,000,000 annually.

PLACER COUNTY has contributed over $1000 to the State Miners' Fund.

THE Tacoma smelter is running almost exclusively on Kootenay ore.

IT is declared that the Trail Creek, B. C., ore carries a high percentage of nickel.

THE mill at the California mine, Washington, Nevada Co., started up again last week.

A TEN-STAMP MILL is to be put on A. V. McDowell's mine, the Columbian, at Baker City, Oregon.

THE Hall Mines Co. offer to put up a smelter at Nelson, B. C., if a $25,000 bonus is forthcoming.

THE new mining law for Arizona, will compel the mine locator to work his claim or abandon it.

AT the Hidden Treasure mine, Sunny South, Placer Co., 110 men are now employed—all white men.

THE Gold Bluff mine, near Downieville, was attached last week by an electric power company of this city.

IDAHO papers say the Tip Top mine at Silver City has been turned over to the owners of the Trade Dollar.

A ROLLER MILL is being put in at the Taylor mine, near Placerville, and will be ready to run next week.

THE old Dixie mill, on Lynx creek, Arizona, has been torn down, and a new ten-stamp mill is to be erected in its stead.

AFTER July 1, the charge in Montana for recording a quartz or placer claim will be $2 instead of $1 as at present.

DURING March there was shipped from Georgetown, Colorado, sixty-nine cars containing 1,726,300 pounds of ore.

THE Elsinore, Cal., *Press* acknowledges the receipt of "the report of the Southern California State Mining Bureau."

TEN stamps and two concentrators are to be added to the mill at the Gold Hill mine at Smith's Flat, Calaveras Co.

THE Colorado Legislature has passed a bill creating a State bureau of mines and appropriating $14,000 for its first year's expenses.

IT is again reported that the War Eagle mine, Trail Creek, B. C., has been sold to the Kansas City Smelter Company for $1,000,000.

AN explosion of fire-damp in the Blue Canyon coal mine, Lake Whatcom, Wash., last Monday afternoon, killed twenty-three men.

FIFTY men are employed at the Standard in the Cœur d'Alene, the ore being of a quality that gives a profit with silver at 63.

TO DATE 121 applications for hydraulic permits have been received by the U. S. Debris Commission. Eighty-six have been granted.

THE Standard Consolidated mine at Bodie is about to receive a new station and sinking pump made by the Dow Steam Pump Works.

THE Blewett mines and mill in the Peshastin, Wash., district, have been leased by former employes of the mining company, and will be started up May 1.

A CARLOAD of machinery for the Natlon Nickel Company is at Lovelock, Nevada, en route to the mines of the company in Churchill county. A smelter is to be built.

THE owners of the Similikameen, B. C., platinum mines claim that theirs is the second largest deposit of the mineral in the world. Active work is to be carried on this summer.

THE Turner Gold Mining Company has incorporated here: Directors—C. Roberts, E. P. Flint, J. Larue, R. T. Wurd and R. H. Campbell; capital stock, $100,000, all subscribed.

FOR the seven days ending March 29th the Finch Mining and Dredging Company at Lytton, B. C., took out 50¼ ounces of gold, valued at $909, the net profit on which was $700.

THE Nez Perces reservation in Idaho is to be opened to settlement on the first of next month. A rich gold mining country is said to be embraced within the borders of this tract.

IN answer to numerous inquiries it is again stated that there is no suspension of assessment work for 1895. The law has not been changed and the requirements are as hitherto.

THE Wadsworth Mining and Milling Company, of Washoe, has incorporated at Wadsworth, Nevada: capital stock $100,000. Trustees and incorporators: C. T. Washeim and W. R. Rich.

THE dividends paid by British Columbia mining companies in Spokane during the month of February aggregated $48,000; the Carihoo $8000, the Le Roi $8000, and the War Engle $32,000.

THE Altura Gold Mill and Mining Company of San Bernardino has increased its capital stock to $1,000,000. E. Otis, J. L. Campbell and T. W. Duckworth of San Bernardino are directors.

GEO. SENN, of this city, is about to open up the Baldwin mine, the Gracie, and Orleans, on Gold Flat, Nevada Co. Considerable heavy machinery will be put up and a large number of men employed.

The quantity of copper with which the Great Falls plant of the Boston & Montana Company is stocked amounts to about 7,000,000 pounds, which when reduced and put into merchantable shape is worth $407,000.

The latest new gold discovery is reported from Alberni, Vancouver's Island, where it is stated quartz taken from the Mountain Rose claim assayed as high as $900 to the ton, the lowest result being given at $40.

THE Denver *Record* says: "Placer miners are paid at San Pedro according to the luck they encounter in finding the pay streak. The wages generally are $1.50 and $2.00 per day, the miners receiving their pay every evening."

A COMPANY has been formed in Vancouver, B. C., to operate platinum hydraulic mining on the Tulameen river. Gold and platinum are said to occur in the gravel there in the proportion of two ounces of platinum to one of gold.

THE Daddy gold mine at Murry, in the Cœur d'Alene, has been closed down and the 55 men discharged, by reason of an injunction granted to the owners of the Yosemite, an adjoining claim. A new 10-stamp mill had just been finished.

THE Sacramento River Gold Mining and Milling Company has incorporated at Redding. Capital stock, $25,000. J. A. Kahny, T. A. Wilson, H. Frickinger, J. G. Burghacker of Redding, and E. Riehe of San Francisco are directors.

A SAN FRANCISCO physician claims great truth in the alleged discovery by M. Groussier of Paris of a scientific means of tracing the paternity of children who know not their own fathers, which becomes a local question of some interest.

THE Banning *Herald* reports that Mr. McHinney's mine, the "Desert Queen," is fully up to the first estimate. The discoverer also sends word that his statement, both as to richness and quantity of the ore, were not in the least exaggerated.

THE United States Debris Commission has begun suit in the case of the North Bloomfield Mining Company for alleged violation of its order in permitting the mine to be operated without constructing a dam in accordance with instructions.

THE United States Treasury Department is at last "going" to put into execution the provision of the new tariff law requiring silver and lead ores imported here to be assayed and sampled at the ports of entry, the principal one of which is El Paso, Texas.

THE Utica Mining Co. is sinking a shaft 1,000 feet deep on the Tryon property in the belief that the ore body found in the Stickle and Utica mines courses in that direction, and that at the depth of a thousand feet the same lode can be tapped.

THE California Debris Commission last Monday granted permits to the Grizzly Hill and the Dry Gulch, near Volcano, Amador Co. The application of the Rattlesnake Bar mine was refused, there being no satisfactory provisions for holding the tailings.

FOR the week ending March 28, 1895, Hillsboro, Sierra county, New Mexico, reports an output of 590 tons, gold ore; a total since January 1st, 1895, of 6360 tons. Most of the gold bullion shipments from that camp came to the Selby Smelting Works, here.

THE Gold Run Mining Company has incorporated at Carson, Nevada, to operate in Humboldt county, Nevada. The capital stock is $1,000,000, divided into 100,000 shares. The Directors are W. D. Tobey, T. R. Hofer, R. M. Clarke, H. Warren and Evan Williams.

THE Utica Water Co.'s reservoir, near Angel's Camp, burst last Thursday afternoon; the water in its rush toward the Mokelumne drowned an old man, Otto Lundt, living on Antonio creek. The dam cost about $45,000, and, it is thought, will have to be rebuilt.

THE African Gold Recovery Company (Limited) announces that 49,260 ounces of gold have been recovered at the Rand, and 8300 ounces in other districts; total, 57,560 ounces during February, by means of their MacArthur-Forrest cyanide process. The January total was 58,634 ounces.

MONTANA MEN have bought the Monita, Pilgrim and Surprise claims on Red Mountain, Trail Creek, B. C., for $60,000, the last payment to be made in eight months. These are extensions of the War Eagle, showing eight feet of ore. A local paper says 100 men will be employed within four months.

THE February output of the Witwatersrand district was 169,295 ounces, being less than the total January yield, which was less than the aggregate for the preceding month of December. London mining papers of the latest date received say this announcement "has stimulated business in the Kaffir market."

S. J. STADE was fatally injured in the south shaft of the Utica mine last Thursday. After endeavoring to "spit" the fuse of two holes to blast, he thought only one ignited and after the first charge exploded returned to light the other fuse. Just as he arrived at the spot the second charge exploded.

MANAGER STONEHAM, of the West Australian gold fields, writes that Coolgardie water can be had anywhere now for four pence per gallon. This is certainly a boon; now that it is known that water costs only eight cents a gallon the California rush to the Coolgardie gold fields will doubtless take the form of an exodus.

THE new law regarding the filing of any articles of incorporation provides that when certified by the Secretary of State, or by the County Clerk of the county where the original articles shall have been filed, they must be received in all the courts of this State, and other places, as prima facie evidence of the facts therein stated.

GEORGE THRASHER, for a Spokane company, is fitting up an outfit for mining on the Clearwater river, near Lewiston, Idaho, and has employed local rivermen to man bateaux to transport his freight to the upper river, twenty-miles above the Little North Fork, where the company has located an extensive bar of placer ground.

THE Philadelphia Gold and Copper Company, has incorporated in Salt Lake, Utah: capital stock $500,000. The property of the company consists of the J. C. Taylor Copper Plant, and other lode mining claims situated in Baker county, Or. J. C. Taylor is president, H. S. Stephens, vice-president; E. S. Sheets, secretary and treasurer.

DEER LODGE COUNTY, Montana, expects the liveliest year in prospecting in its history. Preparations on the part of many parties of gold seekers have already been made for extensive trips to the mountain ranges east, west and north to known mineral belts, and to those believed to exist in hitherto practically uninvestigated regions.

GOVERNOR RICKARDS of Montana is arranging for a conference to perfect an organization for an educational campaign on the silver question, to be held at Salt Lake City, May 15. He has sent a letter to the Governors of California, Oregon, Washington, Nevada, Idaho, Wyoming, Utah, Arizona, New Mexico and Colorado asking them to appoint three delegates to the Salt Lake conference.

IN the suit of the Eastern stockholders of the Bannister Mining Company at Butte, Montana, to cancel $100,000 first mortgage bonds on the ground that they were issued by fraud and in furtherance of a conspiracy among the Montana stockholders and trustees of the company, Judge McHatton of the district Court decided in favor of the Eastern parties and ordered the mortages to be surrendered, the bonds canceled, and the foreclosure sale perpetually enjoined and the repayment of $8000 in interest collected. The bonds were issued to President E. D. Bannister in payment of a mining claim sold to the company by him.

THE Montreal Hydraulic Gold Mining Company has incorporated at Carihoo, "to acquire the property of the Montreal and British Columbia Prospecting and Promoting Company, limited, certain placer mining properties in Cariboo and to operate the same." Capital stock, $250,000. Trustees, P. A. Peterson and J. Kennedy of Montreal, J. M. Browning, F. C. Innes and S. O. Richards of Vancouver.

A BILL passed by the last State Legislature and signed March 23rd amends Section 1416 of the Civil Code relative to notices of intention to divert water. Within sixty days after the notice is posted the claimant must begin work of excavation and pursue it diligently; but if a dam is advised by the California Debris Commission, sixty days are to be allowed after the completion of the dam in which to begin the excavation.

DURING the winter forty-eight men have been washing the banks of the Lardeau, B. C., for gold. Two men took out $3000 in dust and nuggets between them, and all have made good wages. Some of the nuggets taken out were worth $25 each. A large quantity of float, carrying gold, was found in the creek, and the miners will combine and prospect the mountains with the intention of discovering the ledge from whence came this quartz.

THIS is from the Amador *Ledger*: it is about one of California's big gold mines, not six months' travel on the other side of the globe, but a day's journey from this city: "$130,000 taken out of half a ton of rock is good pay ore, and not found every day: yet one day this week the Kennedy Mining Company hoisted a half ton of rock that assayed the above amount. So rich was the ore, it had to be taken to the sulphuret works to be refined; the mill could not handle it."

THE Tacoma Chamber of Commerce furnishes the following statement of Tacoma Smelting & Refining Co., for the month of March, 1895: Number of men employed, 63; pay roll, $4722.96; wood choppers and teams, $640—total, $5362.96; product, 2400 bars bullion weighing 247,317 lbs, copper matte weighing 56,700 lbs; contents—1572.50 ozs. gold at $20.67, $32,503.57; 22,370.25 ozs. silver at $0.63, $14,093.25; 257,274 lbs lead at $3.05 per cwt., $7846.85; 28,740 lbs copper at $0.09⅜, $2694.38—total, $57,138.05.

THE fourteenth annual report of the Hecla Consolidated Mining Company of Glendale, Montana, shows that for 1894 its gross receipts amounted to $146,769.13; it paid out for labor and all other expenses $290,596.35, leaving a net cash profit for the year of $156,172.73. On December 31, 1893, the cash surplus was $106,339.06, which, plus the net cash profit of 1894, is $262,511.84; deducting from this the eight dividends aggregating $120,000 paid in 1894, leaves a net cash surplus December 31, 1894, of $142,511.84.

D. W. BRUNTON, a prominent mining man of Aspen, Colorado, member of the firm of Taylor & Brunton, samplers, and manager of the Della S. mine, has had a preliminary trial before Justice A. P. Snow on the charge of maintaining a blacklist at the mine. A former foreman, Charles McHenry, produced the alleged blacklist in court, which contained the names of over 200 well-known Aspen miners. The Court held him to appear at the next term of District Court in the sum of $500. Considerable feeling exists in Aspen over the facts brought out at the trial.

A GEORGETOWN mining man tells of a queer mineral formation encountered in reopening an abandoned and closed drift in the Baxter mine. In the bottom of the drift is a drain. This drain, he says, was filled with a black paste-like substance which was gathered and put into ore sacks. An assay was made of it which gave a silver value of several hundred dollars per ton. He also tells the *Gazette* of the formation of a sulphide ore going on in the Gambetta lode. A number of years ago a long drift was driven on this property which exposed a continuous vein of zinc blende carrying about fifteen ozs. of silver to the ton. Over the exposed faces of this ore a thin crust of steel-gray mineral is forming which carries about fifty ounces of silver per ton.

ON the 26th ult. the Governor signed the recently-passed bill which amends section 1238, Code of Civil Procedure, relative to eminent domain. The right may be exercised for public uses in the following *new* instances: For "dams and poundings," for hyroads from highways to mines, mills, factories and buildings for operating machinery, or necessary to reach any property used for public purposes; for roads for transportation by traction engines or road locomotives; oil pipe lines; roads for logging or lumbering purposes; canals, reservoirs, dams ditches, flumes, aqueducts and pipes for supplying and storing water for the operation of machinery for the generating and transmission of electricity to mines, quarries, railroads, tramways, mills and factories; for power purposes, and light or heat, or mines, quarries or mills, or for cities and counties, villages and towns, together with lands, buildings and all other improvements in or upon which to erect, install, place, use or operate machinery for the purpose of generating and transmitting electricity for any of the purposes or uses above set forth; finally, electric light lines.

HERE is an (editorial) "prospectus" of a South African gold mining company clipped from the columns of London's ablest and most conservative mining paper: "The claims have been reported on by Mr. Pizzighelli, the Government surveyor. He states that a valuable water right has been secured from the Government in an adjacent stream, and goes with the property, and that there is enough power to drive a 10-stamp battery and accessories. A crushing of 70 tons of ore from the Royal Sheba ground is stated by him to have yielded over 13 dwts. to the ton. Taking it at the lowest estimate of 10 dwts. per ton, the following forecast may be regarded as moderate: Ten stamps will crush 40 tons per day, and working 300 days per year equals 12,000 tons, producing 6000 ounces of gold, or an average of 10 dwts. per ton, 6000 ounces of gold, at £3 17s.6d per ounce, £23,250; working expenses on 12,000 tons, at 12s per ton, £7200; gross profit per year, £16,050. This profit, after deducting £3550 for reasonable depreciation and management expenses, would leave £12,500 net profit—sufficient to pay a dividend of 25 per cent on the entire capital of the company." And those claims are far more moderate than many others at present published in the reading columns of reputable London journals.

Pocket Hunting in California.

NUMBER III.

Written for the MINING AND SCIENTIFIC PRESS by W. H. STORMS, M. E.

There are many pocket mines in Mariposa county, but some of the most noted of these are on the Mariposa estate and have not been worked for many years. Among these is the famous Oso mine, a short distance west of the village of Bear Valley, which vein is said to have produced $400,000 from a series of pockets found at the intersection of crevices. I visited the old workings in the hope of finding some evidence upon which to base an idea of the manner in which the rich deposits of this mine occurred, but the inaccessibility of the workings made this impossible. It was evident, however, that the openings were made along two series of veins, one running north and south, the other east and west.

The Mariposa mine, in the town of Mariposa, was extensively worked at one time, and has always been considered a pocket mine. How much the mine produced it is impossible to say. The known production reached hundreds of thousands of dollars, and it is generally believed, if not positively known, that an enormous amount of gold was stolen by miners working in the mine. Some of the specimens I have seen, said to have come from this mine, make it easy to believe that it would not be a hard matter for a miner to steal a hundred dollars without detection. As nearly as can be learned, the larger pockets found in the Mariposa occurred at or near points where the main vein branched, sending off shoots into the hanging or footwalls. The quartz is highly crystalline. The walls are black slate and diorite porphyrite.

The Missouri Gulch vein, located in the hills a mile northeast of the town of Mariposa, was a famous pocket vein, though not worked to any considerable depth. It was found by the placer miners in early days.

The French mine, on the north slope of Mount Bullion, about three miles northeast of Bear Valley, is a typical pocket mine, and has many openings along its course. Every gulch heading on the vein has been rich in gold. The vein is from one to four feet in width and shows a crystalline structure. Many very handsome quartz crystals have been found in this mine. The enclosing rock is diabase. The usual "gold seams" and "crossings" are said to occur, though I did not see any of the latter fissures.

On Bear Valley mountain is a vein called the Nevada. It strikes northwest and dips thirty degrees to the southwest. The gold occurs in pockets, and usually at a point in the vein where a mass of country rock (altered diabase) is enclosed in the vein. This type of pocket mine is not common in this section.

At a place known as the Bagley Field, northeast of Mariposa, I found a pocket vein in the granite which was unlike those of this region, though I have heard of similar occurrences elsewhere. The vein pitches to the westward, but the inclination is variable. It dips downward in a series of waves, the gold occurring on the flatter parts of the vein. These are called "floors." Neither "gold seams" nor "crossings" were observed in this place. The occurrence of gold, and ore deposits generally, on floors of this description is not uncommon. Just why this is so we can only theorize.

About eleven miles southeast of Coulterville, over the Buckthorn Mountain trail, is an interesting mine called the Black Bart. It is said to have produced a great many thousands of dollars at a very small expense. This mine is somewhat different from the ordinary pocket mine, but at the time I saw it the amount of development would hardly justify passing an opinion as to the persistence of the conditions under which the gold does occur. The formation is diabase altered into chloritic and talcose schist, which at a little distance from the vein becomes slaty or splintery diabase. Through the diabase has been intruded a later eruptive mass, which was found so thoroughly decomposed that positive identification of its character would be impossible, but its general appearance is that of a much decomposed felstone. The dike is from one to four feet in thickness. Immediately above it, and separating the felstone from the diabase, is a quartz vein from a seam to two feet in thickness. The quartz has a glassy appearance, is partly massive and partly crystallized. It may be well to remark here that quartz crystals in a vein is almost always an indication of bunchy pay or pockets in the Southern mines.

The first pocket found in the Black Bart produced $13,000, and was taken out within thirty feet of the surface. The men working this mine told me that they had learned from experience when a pocket was being approached. The indications were a highly mineralized condition of the quartz and the occurrence of a greenish scaly matter in the decomposed dike rock. The same conditions were observed in the Boudurant mine, five miles northwest of the Black Bart.

The dike rock of this mine is remarkably similar to that found in the Bonanza mine at Sonora, in Tuolumne county. The Black Bart vein is a well-defined fissure, and its course can be traced a long distance by the numerous old dumps made by earlier workers.

It is said of this interesting little mine that when a depth of thirty feet had been reached in the shaft the owners were compelled to seek assistance in carrying their work further. A partner was taken in, who put in some money on the showing already made. On the first shift he made a suggestion that the shaft be enlarged a little by breaking down a portion of the hanging-wall. One of the original partners thought the footwall would prove easier to work out, and accordingly the shot was put in the footwall. The first blast produced an unanticipated but happy result, for on going down after the blast to note its effect, the bottom of the hole was found glittering with gold. From that point the footwall was taken out to the surface, resulting in a cleanup of $13,000 in about two weeks.

Two men who prospected a flat on the summit of Buckthorn mountain for more than a month before finding pay, were repaid by taking out over $2000 within a month after finding the vein for which they had searched so long.

The story is told that Samuel L. Clemens (Mark Twain) was at one time a pocket hunter. He and his partners were not as fortunate in their search as some others. One day they had worked faithfully surfacing up a hillside and had actually located what they supposed to be the near vicinity of the coveted pocket. Heavy black clouds had overshadowed them in the meantime, and soon the great drops of rain began to fall, coming thicker and faster, and "Mark" and his pards dumped the dirt where they had found it and ran for shelter. Later they went home, and there Clemens wrote the renowned but ridiculous story that gave him his first fame—"The Jumping Frog of Calaveras." Soon after some Portuguese prospectors came upon the fresh work so hastily left by the Americans. The rain had washed away the dirt and gold was seen shining among the yellow earth. They kept the find secret for a long time, though it is said they took $7000 out with very little labor.

THE PORPHYRY BELT.

Beginning six or seven miles east of the town of Mariposa and extending in a northwesterly direction to Buckthorn Mountain, a distance of fifteen miles or more, is a great dike of eruptive rock of granitic type. This rock ranges in texture from felsite to granulite at the southern end and becomes somewhat coarser toward the northern end, where it often takes on the regular granitic habit, though still, for most part, fine grained.

Along the entire belt a large amount of development has been done, particularly on the southern end, where, for a distance of three miles or more, from a camp called Mono to another known as Colorado or "Colorow," it has been opened extensively both on the surface and at some points underground. I regret to say that the extremely bad condition of these old workings made it too dangerous to permit of a thorough inspection at all points, but wherever it was possible careful observation was made, and it appeared that the geological and mineralogical conditions were similar throughout this southern section of the belt. The largest and best exposures were found in a mine owned by George Lacy, near Colorado, and as the conditions found here are similar in all the others, a single description will suffice for all on this part of the lode. This belt is locally called and has heretofore been generally described and referred to as the "Talc mines." The rock forming the dike is not magnesian but quartzose and aluminous, being a decomposed granite of fine grain.

The dike varies from four to about thirty feet in width, and in a few places it was observed that it had sent branches out into the country rock—a fine, smooth slate. The dike strikes northwest and stands nearly perpendicular. The only variation in dip was the apparent change due to the swelling or pinching of the dike material. It conforms, as nearly as could be ascertained, to the general strike of the slates.

The entire mass of the dike rock is shattered and seamed in every direction. Many of the seams are filled with infiltrated veinlets of quartz.

The most prominent of these quartz-filled seams or veins is a series which crosses the dike from wall to wall, and not extending beyond the limits of the dike rock itself. These seams are from an inch to a foot or more in thickness. The seams occur with quite noticeable regularity, lying nearly flat, about four to six feet apart. The seams are filled with highly crystallized quartz, silicious limonite, black manganese oxide and decomposed dike material. Many of the quartz crystals are of great beauty and some of them of considerable size—four to six inches in diameter. I saw two crystals of large size at Colorado containing pretty inclusions of moss-like, greenish material, probably chlorite.

In the northern portion of this mine the strike of these quartz seams is northeasterly, nearly at right angles to the strike of the dike. In this portion of the mine the gold, which always occurs in pockets, is found near the east wall, either imbedded in the quartz or lying between the quartz and the dike rock.

In the southern portion of the mine the strike of the seams is due east and west, the dip seventy-seven degrees north. Strange to say, here the gold is found under similar conditions on the west side of the dike, directly contrary to the position it was found to occupy at the northern end. I was unable to give sufficient time to a study of the conditions to find any reason for this peculiar freak of gold deposit. A complete, careful study of the conditions under which pockets occur here would be most interesting.

The development of these mines is, as has been stated, largely superficial—that is, by a series of open excavations, made along the surface and upper portions of the dike. In the Lacy mine alone there has been removed 100,000 tons of rock, and mostly by one man—the owner. The open cut is 600 feet long, from 20 to 60 feet wide, and at one place 100 feet wide (due to a slide of the wall rocks into the pit).

The pockets are carefully searched for at the points indicated. The waste resulting from a season's work, consisting of broken masses of dike rock, quartz and slips from the walls, is allowed to accumulate in the pit, and the whole is sluiced out by the hydraulic method when sufficient water is available. Fortunately, there is abundant dump, as the mines are a thousand feet or more above the canyon of the Merced river.

The gold obtained is coarse and occurs in forms of great beauty, forming pieces suitable for jewelry which the most expert goldsmith would be puzzled to duplicate. It usually has a crystallized appearance and frequently retains what seems to be the impression of the matrix of quartz in which it was formed. There are delicate markings and indescribable flutings seen under a lens not noticed at a casual inspection. Many of these pieces are sold at a price exceeding their intrinsic value.

The quartz contains no fine gold as far as known and is not saved; all the gold recovered in working these mines is readily seen with the unaided eye and picked out by hand.

Ten or twelve miles northwest of the Lacy mine, on the north side of Merced river, is found a series of these mines on the same dike. The open cuts can be seen for miles in bold relief among the dark green chimisal brush which covers the otherwise barren hills.

The mines most extensively opened on this portion of the belt are known as the Defiance and Harrison. The dike rock in this section is from thirty to more than 100 feet wide. The rock is harder and more firm than at Colorado, but still greatly altered. The quartz veins crossing the dike lie mostly more nearly horizontal, and gold is found on both sides of the dike. The country rock enclosing the dike is similar to that south of the river, though rather more shaly. The dip of the dike is from seventy-five to eighty degrees. These pockets have undoubtedly enriched the numerous gulches heading up in the vicinity of the dike. Solomon's and Flyaway gulches were famous placer fields.

The scarcity of water on these high hills has proven a great drawback in working these mines in the past. The belt is fully fifteen miles in length and not over seven miles of it has been prospected, and even in the largest mines the amount of underground development is comparatively small. It would appear that this might prove a field for the pocket hunter to exercise his skill and perseverance.

Placer County Mines.

TO THE EDITOR:—The Blue Canyon placer gravel mine, owned by S. C. Jordan of Dutch Flat, has lately been bonded to W. T. Jackson of Sacramento and Prof. F. J. Kimball, et al., for three years. The parties who have bonded it propose to run a tunnel into the mine the length of 2800 feet, which will tap the channel.

The Shady Run quartz mine, also owned by Mr. Jordan, located five miles east of Dutch Flat, has been bonded to New York capitalists for a period of ten months. This new company propose to put up a mill and thoroughly develop this mine. This mine, the ore of which runs fifteen per cent of gold, has two distinct ledges; one is a foot wide and 100 feet deep; the other is six feet wide and sixty feet deep. Mr. Jordan feels confident that with these new companies the output will increase and prove a profitable investment both for the new companies and himself.

Mr. E. Mallons, who owns the Golden Shaft mine, near the edge of Dutch Flat, which has a shaft down already ninety feet, intends to at once go ahead with developing his mine by running side drifts and erecting an eight-stamp mill thereon. The mill is on the road and, as soon as the weather permits, the work will be pushed. It is a cement gravel mine, and Mr. Mallons estimates the total expense of getting ready will be $10,000, two-thirds of which amount has been expended. It is expected to pay from $3 to $4 per ton. The skip process self-dumping apparatus is adopted.

W. S. Garrett, superintendent of the Polar Star gravel mine at Dutch Flat, states that ground sluicing and hydraulicking was commenced on the 1st inst., and is to continue through the summer. They have employed thirty men and anticipate a

prosperous season. The claim contains 107 acres and they are washing on the bed rock with a 150-foot bank. Everything has been fitted up to meet the demands of the business.

At Iowa Hill it is claimed that over $3,000,000 in gold has been taken out just north of and adjoining the town, and more is left for the next generation. A Mr. Brown, who had a claim near Iowa Hill in 1854 that paid $10 to the pan, returned—after an absence of forty-one years—a few weeks ago, and found his claim just as he left it, minus the $10 per pan.

Miners looking for work and prospectors looking for good paying locations, are constantly met on the road, going to and fro, as in the days of old, by yours truly, TRAVELER.

Development of Mines.

Demands for Locations — Foreign Cut in Wages — Present System of Business, Etc.

TO THE EDITOR:—On a recent trip in the mining districts several things were forcibly impressed upon my mind, and one is the utterly absurd values placed on mining prospects that are in many instances mere locations and in others but holes of 10, 15 or 30 feet deep.

It should be borne in mind that such senseless demands are simply causing property to lie undeveloped and possibly unproductive, to the detriment of both the owner and the community where located. Many act on the principle that "the fools are not all dead yet," and that some one will come along who will be charmed with the idea that there is no "hole in the ground" and make the purchase, while the fact is—in mining ventures—the fools are all dead, and unreasonable demands make poor business.

When it comes to development of locations, the "prospecting" miner cannot put in his time to a better purpose than properly opening his supposed mine, and develop thereby a value which will give some guarantee for a reasonable amount to be paid. A well-opened mine, by the expenditure of considerable labor, is really more salable at a high price than a less developed one at a low figure. It is to be hoped for the business of the State that the "prospecting" miner will make developments on his valuable property before offering the same for sale; if unable to do so, he would benefit himself and the community by offering somebody one-half for a certain amount of development work. How many "prospectors" are there who have claims that they have held for years with nothing of value done on them! There should be an end to such a system. It does not benefit any individual. Work benefits the entire people, and now that the mining interest is "looking up," every undeveloped-mine owner should watch the chance for making active such "prospects" as he may have.

That there is great injury inflicted on the community of every town and county by this "dog-in-the-manger" policy as to locations, every one certainly knows; the persons to correct it are the claimants themselves, and the way is by inaugurating a more liberal and active policy.

While I am on the question of development, I want to say that the American miner does not as yet, except in a very few instances, show the same amount of mining dash and venture as the English mine operator. I mean in the way of laying out a large work, requiring vast capital before any returns are to be expected. The American miner moves as though having a great doubt, the Englishman with confidence and a knowledge that development of great depth will bring success, while scratching about the surface simply scatters money and often produces failures. I am aware that we have in California deep workings by American enterprise, but these are mainly the result of the large output of rich ore they keep going for. In South Africa at this time several companies are expending from one million to one and a half million of dollars on development and plant before expecting to have one dollar of returns. That is mining with confidence. I do not mean to say that this is desirable at all times, but I do say that we on this coast want to enlarge our ideas as to development and to take up the pursuit of mining with more confidence, and instead of going into development work by piecemeal, start to open our mines to a depth of a thousand feet, considering this the requisite for determining as to the real value of any lode having favorable features about it. Every prepossessing mineral-bearing lode at one point or another of a thousand-foot development is very likely to produce more value than the entire cost of such a development.

Of course, this takes capital as well as confidence. Here in California we have unbounded wealth in our mines and we do not appreciate the gift. Our business men, with a very few exceptions, do not encourage mining enterprises or in any way strive to build up an industry that has more real wealth and is of more benefit to the whole people than any one single industry. Grains, fruits and wines do not add the volume to the world's capital that mining does. Within the past ten years there has been invested in South Africa over $1,000,000,000 of European capital, the greater part of it going there in the past six years. This vast investment in mines has been giving an output of from $20,000,000 to $30,000,000 per annum. The amount of money Europeans have put into mining enterprises in South Africa, Australia and New Zealand is beyond all calculation, and here in this great gold-bearing State, with double the advantages in every sense, we have not the pluck nor enterprise to produce even $13,000,000; in fact, Wells, Fargo & Co.'s estimate for 1894 was only $10,690,646.

If we have a good mining property the first thing we do is to sell our chances to some foreign investor, who seldom buys bad properties. This done, the purchaser, in very many instances, on taking possession looks around and commences work at once, ostracizing the Americans and putting in their stead men of his own nationality; if he is English he puts in Englishmen, if French then Frenchmen, and so on through all nationalities. This is natural, but the American does not do it. The main object in doing so is to reduce wages, which is too often done. I have in mind an English company who no sooner took possession of a property than the miners' wages were cut from $50 a month to $40, and general labor from $1.25 per day to $1 and board. By such operations all outlays for labor go into the hands of a poor foreign element, who are kept poor by poor reward for their labor. This reducing of wages to a pittance insures better profit for the company, all of which when made is at once shipped out of the country. The employing of special nationalities in preference to Americans is not so detrimental to the general interest, for these laborers are citizens and, through necessity, must distribute their gains. For the best interests of our State, however, we should operate and own our mines, and thus hold all the product for the benefit of our people. Californians do a great deal of talking as to what ought to be done in order to make more general prosperity for the masses but, as a business community, will not maintain it. From a former liberal policy of business we have drifted too much into the "cent-per-cent" channel of thought instead of into a broad industrial one, which in time would afford every man employment and keep our money at home.

Recently we subscribed over $2,500,000 for the San Joaquin railroad, and at once gave a contract for rails, etc., which will carry away at least $2,000,000 of the people's money, when the whole outfit should have been made in San Francisco. One may say the outfit could not be made here for the same money. There was no effort to see if all the work could be done here. There was no conference of capital and labor to test this question. Suppose it costs 10% more, would not we all be better off by distributing this labor and capital among our own people? The money would then be here for some other operation. We have the location and foundation for one of the wealthiest communities on the face of the globe—a grand field for men of brains, enterprise and capital to work in—and where are we?

Is there not a wrong system in operation? Our manufacturing establishments are virtually idle and yet we are building and buying all the time, enriching other States by paying away our gold instead of planning to keep it at home. This is our way of doing business, but ought we not change it? What wants to be done for the good of all is to get every prospective mine opened as a producer. Keep the resources of every developed mine here; this means more money and more employment of our labor, and, in connection with this, have all our wants supplied by home production—in other words, get out and put into circulation more money and keep it here in general circulation. ALMARIN B. PAUL.

San Francisco, April 3, '95.

Mother Lode Power Company.

The Mother Lode Power Company has been organized to furnish electric power to the mines between the Mokelumne river and Amador City. They own a water right, taking the water from a point above Tripp's mill and will carry it down the river several miles, where a generating station will be put in. Here a plant will be installed, supplied with the latest types of multiphase electric machinery, similar to that now being put in at the celebrated Niagara Falls station.

From this point lines will be run so as to be in position to furnish power to a large number of mines. The capacity of the plant will be 1000-horse power, and it is intended to have things ready to furnish this amount before the next winter. Bonds are now being subscribed, and active operations will begin in a few days. The entire installation will be in the hands of the firm of Hasson & Hunt of San Francisco, who had entire charge of the installation and operation of the magnificent plant at the Midwinter Fair.—Amador Republican.

A LONDON cable says: Practical advantage has already been taken by the British postal authorities of the new method of telegraphy without wires. The cable from Scotland to the Isle of Mull was broken for a week, and during that time the inhabitants remained in electric communication with the mainland by means of the induction apparatus. The distance from the mainland is two miles. There were already wires along the island coast. A parallel wire was erected on the coast of the mainland, and messages sent over it were received by telephone connected with the wire on the island, and vice versa.

Description of the Gold Belt of California.*

Written by H. W. TURNER.

The gold belt of California includes that portion of the Sierra Nevada lying between the parallels of 37° 30 and 40°. This area is bounded on the east by the great basin and on the west by the great valley of California, comprising about 17,000 square miles. The Sierra Nevada here forms a single range, sloping somewhat abruptly toward the great basin and gradually toward the great valley of California. Within this area lie the chief gold deposits of the State, though by no means all of the area is auriferous. At the northern limit the deposits are scattered over nearly the entire width of the range, while to the south the productive region narrows to small dimensions. The mass of the range south of Alpine county is comparatively barren. North of the 40th parallel the range is probably not without deposits, but the country is flooded with lavas which effectually bury them.

The rocks of the Sierra Nevada are of many kinds and occur in very complex associations. They have been formed in part by deposition beneath the sea, and in part by intrusion as igneous masses, as well as by eruption from volcanoes, and portions of them have been subsequently metamorphosed.

The southern portion of the range is composed of granite. The central and northern part, west of longitude 120° 30', consists prevailingly of schists, which have been produced by intense metamorphism of both ancient sediments and igneous rocks, and it is chiefly but not solely in these schists that the auriferous quartz veins occur. The trend of the bands of altered sediments and of the schistose structure is generally from northwest to southeast, parallel to the trend of the range, but great masses of granite and other igneous rocks have been intruded among these schists, forming irregular bodies which interrupt the regular structure and which are generally bordered each by a zone of greater metamorphism. These schists, with their associated igneous masses, form the older of two great groups of rocks recognized in the Sierra Nevada. This group is generally called the bedrock series.

Along the western base of the Sierra occur beds of sandstone and clay, some of which contain thin coal seams. These are much younger than the mass of the range and have not shared the metamorphism of the older rocks. They dip gently westward beneath the later deposits, which were spread in the waters of a shallow bay occupying the valley of California and portions of which have been buried beneath recent river alluvium.

Streams flowing down the western slope of the Sierra in the past distributed another formation of great importance—the auriferous gravels. The valleys of these streams served also as channels for the descent of lavas which poured out from volcanoes near the summit. Occupying the valleys, the lavas buried the gold-bearing gravels and forced the streams to seek new channels. These have been worn down below the levels of the old valleys, and the lava beds, with the gravels which they protect, have been isolated on the summits of ridges. Thus the auriferous gravels are preserved in association with lavas along lines which descend from northeast toward southwest, across the trend of the range. The nearly horizontal strata, together with the auriferous gravels and later lavas, constitute the second group of rocks recognized in the Sierra Nevada. Compared with the first group—the bedrock series—these may be called the superjacent series.

The history of the Sierra Nevada, even so far as it is recorded in the rocks, has not yet been fully made out, but the events of certain epochs are recognized, and these may be stated in a brief summary in the order in which they occurred.

THE PALEOZOIC ERA.

During the Paleozoic era, which includes the periods from the end of the Algonkian to the end of the Carboniferous, the State of Nevada west of longitude 117° 30' appears to have been dry land of unknown elevation. This land probably extended westward into the present State of California and included part of the area now occupied by the Sierra Nevada. Its western shore was apparently somewhat west of the present crest, and the sea extending westward received Paleozoic sediments which now constitute a large part of the central portion of the range.

At the close of the Carboniferous the Paleozoic land area of western Nevada subsided, and during a portion or all of the Juratrias period it was at least partly covered by the sea. At the close of the Juratrias, according to the latest paleontological determinations, the Sierra Nevada was upheaved as a great mountain range, the disturbance being accompanied by the intrusion of large amounts of granite.

The auriferous slate series comprises all of the sedimentary rocks that entered into the composition of this old range of Juratrias time. Formations representing the Algonkian and all of the Paleozoic and

*From the Geologic Atlas of the U. S.

Juratrias may therefore form part of the auriferous slate series.

Fossils of Carboniferous age have been found in a number of places, and the presence of silurian beds at the northeast base of the range has been determined. A conglomerate occurs in the foothills of Amador and Calaveras counties, interbedded with slates containing carboniferous limestone; this conglomerate is therefore presumably of Carboniferous age. The conglomerate is evidence of a shore, since it contains pebbles of quartzite, diabase and hornblende-porphyrite, which have been rounded by the action of waves. The presence of igneous pebbles in the conglomerate shows that volcanic eruptions began at a very early date in the formation of the range, for the hornblende-porphyrite pebbles represent lavas similar to the hornblende-andesites of later age.

The Paleozoic sediments of the gold belt consist of quartzite, mica-schist and clay-slate, with limestone lenses. Rounded crinoid stems, *Lithostrotion*, *Fusulina*, *Clisiophyllum*, *Spirifera*, and other genera have been found, chiefly in the limestone, and indicate that the age of the rocks is Carboniferous. The Paleozoic sediments are finely exposed in Calaveras county, and on the gold belt sheets they will be designated the Calaveras formation. It is probable that some areas mapped as Calaveras may contain strata earlier or later than the Carboniferous.

During an epoch of upheaval some time after the close of the Carboniferous period, these sedimentary strata were raised, forming part of a mountain range. The beds were folded and compressed, and thus rendered schistose. Granite and other igneous rocks were intruded among them, and they assumed somewhat the relations which they now exhibit in the Sierra Nevada. But those masses which now form the surface were then deeply buried in the foundations of the range. They have been brought to the present surface by subsequent uplifts and prolonged erosion.

JURATRIAS PERIOD.

The areas of land and sea which existed during the earlier part of this period are scarcely known. Strata showing the former presence of the sea have been recognized in the southeastern portion of the range at Mineral King, where the sediments are imbedded in eruptive granite, and at Sailor Canyon, a tributary of American river. Rocks of this age occur generally throughout the great basin and the Rocky mountains, but the interior sea or archipelago in which they were deposited was apparently separated from the Pacific by a land mass stretching the length of the Sierra Nevada. This land probably originated in the upheaval above referred to, some time after the close of the Carboniferous, and toward the end of the Juratrias period its area became so extensive that the waters of the Pacific seem to have been completely separated from the interior seas. This conclusion is based upon the fact that fossils of Jurassic age in California, so far as known, have closer relations with those of Russia than with those of eastern America.

The genus *Aucella*, whose shells occur in Russia, flourish on the Pacific coast until well into the Cretaceous, and is distributed from Alaska to Mexico. In the Juratrias strata of California it is associated with ammonites of the genera *Perisphinetes*, *Cardioceras* and *Amaltheus*, which are closely related to forms of the European Upper Jurassic.

The strata in which these fossils occur are prevailingly clay slates, which are locally sandy and contain pebbles of rocks from the Calaveras formation. Thus it is evident that they were deposited near the shore of a land composed of more ancient schists, and the generally fine character of the sediment shows that the land which occupied the area of the Sierra Nevada cannot have been very mountainous. These strata now occur in two narrow bands along the western base of the range, and are called the Mariposa formation, from the fact that they are well exposed near Mariposa.

Soon after the Mariposa formation had been deposited the region underwent uplift and compression. The result of uplift was the development of a mountain range along the line of the Sierra Nevada. The Coast Range also was probably raised at this time. The action of the forces was such as to turn the Mariposa strata into a vertical position, shattering the rock and deforming it, and producing some metamorphism. The clay shales now have a slaty structure, produced by pressure, which appears to coincide in most cases with the bedding. It was a time of intense eruptive activity. The Mariposa beds were injected with granite, and vast masses of diabase, associated with other basic igneous rocks, date from this time. There is evidence that igneous rocks were intruded in varying quantities at different times, but that the intrusion of the great mass of the igneous rocks accompanied or immediately followed the upheavals is reasonably certain.

The Mariposa beds carry numerous gold veins, the most important group of which constitutes the famous "Mother lode." It is believed that most of the gold veins were formed after this upheaval, and as a consequence of it, occupying fissures opened during the uplift.

The disturbance following the deposition of the Mariposa beds was the last of the movements which produced the vertical arrangement of the auriferous slate series. The strata of succeeding epochs are sediments and tuffs. Lying nearly horizontal or at low angles, they prove that since they were accumulated the rock mass of the Sierra Nevada has not undergone much compression. But the fact that they now occur high above sea level is evidence that the range has undergone elevation in more recent time.

CRETACEOUS PERIOD.

By the close of the Juratrias the interior sea of North America had receded from the eastern base of the Sierra Nevada eastward beyond the Rocky mountains. From the western part of the continent the waters of the Pacific had retired in consequence of the Juratrias uplift. The valley of California was then partly under water, and the Coast Ranges seem to have been represented by a group of islands, but during the later Cretaceous the region subsided and the sea substantially overflowed it. Through gradual changes of level the areas of deposition of marine sediments were shifted during the Cretaceous and Neocene periods, and late in the Neocene the sea once more retreated west of the Coast Ranges. The deposits laid down during this last occupation of the valley of California belong to the superjacent series.

The advance of the sea spread a conglomerate over the eastern part of the valley in later Cretaceous time, and sandstone and shale were subsequently deposited. This formation is well developed near Chico, and at Folsom, on the Sacramento sheet. It has been called the Chico formation.

EOCENE PERIOD.

In consequence of slow changes of level without marked disturbance of the Chico formation, a later deposit formed, differing from it somewhat in extent and character. The formation has been called the Tejon (Tay-hone). It appears in the gold-belt region at the Marysville Buttes, aud it is extensively developed in the southern and western portions of the valley of California.

NEOCENE PERIOD.

The Miocene and Pliocene ages, forming the later part of the Tertiary era, have in this atlas been united under the name of the Neocene period. During the whole of the Neocene the great valley of California seems to have been under water, forming a gulf connected with the sea by one or more sounds across the Coast Ranges. Along the eastern side of this gulf was deposited during the earlier part of the Neocene period a series of clays and sands to which the name Ione formation has been given. It follows the Tejon, and appears to have been laid down in sensible conformity to it. Marine deposits of the age of the Ione formation are known within the gold belt only in the Marysville Buttes. Along the eastern shore of the gulf the Sierra Nevada, at least south of the 40th parallel, during the whole of the Neocene, and probably also during the Eocene and latest Cretaceous, formed a land area drained by numerous rivers. The shore line at its highest position was several huudred feet above the present level of the sea, but it may have fluctuated somewhat during the Neocene period. The Ione formation appears along the shore line as blackish-water deposits of clays and sands, and frequently it contains beds of lignite.

The drainage system during the Neocene had its sources near the modern crest of the range, but the channels by no meaus coincided with those of the present time. The auriferous gravels for the most part accumulated in the beds of these Tertiary rivers, the gold being derived from the croppings of veins. Such gravels could accumulate only where the slope of the channel aud the volume of water were sufficient to remove the silt while allowing the coarser or heavier masses to sink to the bottom with the gold.

The climate of the late Neocene was warm and humid, much moister thanit would have been if the great valley had been above water, and erosion was correspondingly rapid.

A mountain-building disturbance occurred duriug the Neocene period. This was caused by pressure acting from the SSW. toward the NNE. with a downward inclination. One effect of this pressure was to induce movements on a network of fissures, often of striking regularity, intersecting large portions of the range. It is not improbable that this fissure system originated at this time, but there are fissures of greater age. This disturbance also initiated an epoch of volcanic activity accompanied by floods of lavas† consisting of rhyolite, andesite and basalt, which continued to the end of the Neocene. These lavas occupy small and scattered areas to the south, increasing in volume to the north until, north of the 40th parallel, they cover almost the entire country. They were extruded mainly along the crest of the range, and often followed fissures belouging to the system mentioned above. The recurrent movements on the fissures were probably accompanied by an increase in the development of the fissure system. An addition to the gold deposits of the range attended this period of volcanic activity.

When the lavas burst out they flowed down the river channels. Sometimes they were not sufficient to fill the streams, and are now represented by layers of "pipe clay" or similar beds in the gravels. These minor flows were chiefly rhyolite. The later andesitic and basalt eruptions were of great volume, and for the most part completely choked the channels into which they flowed. The rivers were thus obliged to seek new channels—substantially those in which they now flow.

Fossil leaves have been found in the pipe clay and in other fine sediments at numerous points. Magnolias, laurels, figs, poplars and oaks are represented. The general facies of the flora is thought to indicate a low elevation, and has been compared with that of the flora of the South Atlantic coast of today.

PLEISTOCENE PERIOD.

During Cretaceous and Tertiary time the older Sierra Nevada had been reduced by erosion to a range with gentle slopes. An elevation of the range doubtless attended the Neocene disturbance above referred to, and minor dislocations probably recurred at intervals; but at the close of the Tertiary a greater uplift occurred, which was accompanied by the formation of normal faults. These were widely distributed throughout the range, particularly along the eastern escarpment, where they form a well-marked zone to the west of Mono lake and Owen lake. As a consequence of this elevation the streams, having greater fall, cut new and deep canyons in the hard but shattered base of the pre-existing mountains.

A period of considerable duration elapsed between the emission of the lava flows which displaced many of the rivers and the time at which the higher Sierra was covered by glaciers. In the interval most of the deep canyons of the range were cut out. Such, for example, are the Yosemite valley on the Merced river, the great canyon of the Tuolumne, and the canyon of the Mokelumne. The erosion of these gorges was often facilitated by the fissure system referred to above, and many of the rivers of the range follow one or other set of parallel fissures for a long distance.

It is a question at what point the limit between the Neocene and Pleistocene should be drawn. It has become usual to regard the beginning of the Glacial epoch in eastern United States as the close of the Neocene. If it could be shown that the glaciation of the Sierra was coeval with that of northeastern America, a corresponding division would be adopted. It is believed, however, that glaciation was much later in California than in New England, and that the great andesitic flows mark the close of the Neocene.

The Sierra, from an elevation of about 5000 feet upward, was long buried under ice. The ice did not to any noticeable extent erode the solid rock in the area which it covered, although it removed enormous amounts of loose material. Its seems rather to have protected it from erosion while intensifying erosion at the lower elevations, just as would a lava cap. Small glaciers still exist in the Sierra.

IGNEOUS ROCKS.

Rocks of igneous origin form a considerable part of the Sierra Nevada. The most abundant igneous rock in the Sierra Nevada is granite, this term embracing both granodiorite and true granites. Rocks of the granitic series are believed to have consolidated under great pressure and to have been largely intruded into overlying formations at the time of great upheavals. Thus granite is a deep-seated rock, and is exposed only after great erosion has taken place.

The rocks called diabase and augite-porphyrite on the gold belt maps are not always intrusive, but to some extent they represent surface lavas and correspond to modern basalt and augite-andesites. In like manner, some of the hornblende-porphyrites correspond to hornblende-andesites.

GLOSSARY OF ROCK NAMES.

The sense in which the names applied to igneous rocks have been employed by geologists has varied and is likely to continue to vary. The sense in which the names are employed in this article is as follows:

Gabbro.—A granular intrusive rock consisting principally of diallage or allied monoclinic pyroxene, or a rhombic pyroxene, together with soda-lime and lime feldspars.

Gabbro-diorite.—A term used to indicate areas of gabbro coutaining primary and secondary hornblende and areas containing intimate mixtures of gabbro and diorite.

Pyroxenite.—A granular intrusive rock comprised principally of pyroxene.

Peridotite.—A granular intrusive rock generally composed principally of olivine and pyroxene, frequently of olivine alone.

Diorite.—A granular intrusive rock consistiug principally of soda-lime feldspar and hornblende.

Serpentine.—A rock composed of the mineral serpentine, and often containing unaltered remains of feldspar, pyroxene or olivine. Serpentine is fre-

†The term "lavas" is here used to include not only such material as issued from volcanic vents in a nearly anhydrous condition and at a very high temperature, but also tuff-flows and mud-flows, and, in short, all fluid or semi-fluid effusive volcanic products.

quently a decomposition product of rocks of the peridotite and pyroxenite series.

Granodiorite (quartz-mica-diorite).—A granular intrusive rock having the habitus of granite and carrying feldspar, quartz, biotite and hornblende. The soda-lime feldspars are usually considerably and to a variable extent in excess of the alkali feldspars. This granitic rock might be called quartz-mica-diorite, but this term, besides being awkward, does not sufficiently suggest its close relationship with granite; it has therefore been decided to name it "granodiorite."

Granite-porphyry.—A granite with large porphyritic potash feldspars.

Amphibolite, amphibolite-schist.—A massive or schistose rock composed principally of green hornblende, with smaller amounts of quartz, feldspar, epidote and chlorite, and usually derived by dynamo-metamorphic processes from diabase and other basic igneous rocks.

Diabase.—An intrusive or effusive rock composed of augite and soda-lime feldspar. The augite is often partly or wholly converted into green, fibrous hornblende or uralite.

Augite-porphyrite.—A more or less fine-grained rock of the diabase series, with porphyritic crystals of augite and sometimes soda-lime feldspars.

Hornblende-porphyrite.—An intrusive or effusive porphyritic rock consisting of soda-lime feldspars and brown hornblende in a fine groundmass.

Quartz-porphyrite.—An intrusive or effusive porphyritic rock consisting of quartz and soda-lime feldspar, together with a small amount of hornblende or biotite. It is connected by transitions with granodiorite and with the following:

Quartz-augite-porphyrite.—This the same as the above except that it contains augite. It is connected by transitions with augite-porphyrites and with quartz-porphyrites.

Quartz-porphyry.—An intrusive or effusive porphyritic rock, which differs from quartz-porphyrite in containing alkali feldspars in excess of soda-lime feldspars.

Rhyolite.—An effusive rock of Tertiary or later age. The essential constituents are alkali feldspars and quartz, usually with a small amount of biotite or hornbleude in a groundmass, often glassy.

Andesite.—An effusive porphyritic rock of Tertiary or later age. The essential constituents are soda-lime feldspars and ferromagnesian silicates. The silica is usually above fifty-six per cent.

Basalt.—An effusive rock of Tertiary or later age, containing soda-lime feldspars, much pyroxene, and usually olivine. The silica content is less than fifty-six per cent. It is also distinguished from andesite by its structure.

A Satisfactory Test.

One of the 5000-horse power double inverted turbine wheels and the 5000 electrical generator at Niagara Falls were tested last Saturday in the presence of the officers and stockholders of the Construction and Power Company. The No. 1 turbine wheel was used. The machine was started at seventeen revolutions per minute, and increased gradually to thirty-two revolutions. To generate 5000-horse power 250 revolutions must be reached. The mass of steel and iron comprising the wheel, shaft and dynamo, estimated at seventy-five tons, was held poised on the bearings by the weight of the water which strikes the turbines from below. The huge mass bobbed up and down like a cork on the water. There was no hitch or jar in the running of the turbine. The electric generator was not connected with the armature, and no electricity was provided. The secretary states that the results were wholly satisfactory.

THE Gates Iron Works, of Chicago, which for over fifty years has been located between Madison and Washington streets, will move this month, and after May 1st will occupy the new works fronting on Elston avenue, Bloomingdale road, Redfield and Stein streets, the office address being 690 Elston avenue. The branch office will be Room 1205, Stock Exchange Building, La Salle and Washington streets.

Personal.

W. C. MINEAR is in charge of the operations at the Hite mine, Mariposa Co.

STATE MINERALOGIST CRAWFORD has returned from El Dorado county.

W. S. CHAPMAN is in Mariposa Co. arranging for work on the Vanderhilt mine.

T. A. RICKARD is now State Geologist of Colorado—a most excellent appointment.

PAUL SCHULTZE has resigned his position of general land agent of the Northern Pacific at Tacoma, Wash.

MR. AND MRS. JNO. HAYS HAMMOND sailed from London on the 30th ult. for Johanneshurg, where they will permanently reside.

PROF. H. V. WINCHELL, accompanied by F. F. Sharpless, is examining the auriferous black sands on the Coos county, Oregon, beach.

T. B. WILCOX, of Portland, Or., has been elected vice-president of the Washington & Columbia River Road. He succeeds C. B. Wright Jr.

CHARLES D. WALCOTT of the United States Geological Survey has had conferred upon him the Bigby medal of the Royal Geological Society of England.

F. W. MADERA has been appointed Pacific coast passenger agent of the C., B. & Q. Road, with headquarters in this city He succeeds T. D. McKay, who resigned last Decemher.

THE GOVERNOR has appointed E. E. Leake, of Woodland Commissioner of Public Works, vice A. H. Rose, term expired. The position is for four years at an annual salary of $4000.

COL. JNO. WEIR, of New York, who was here recently, and bought considerable mining machinery, has had it sent to Sonora, Mexico, where he has secured title to the La Mexicana, in the Ures district.

J. T. GRIBBLE is the new superintendent of the Reward mine, Nevada City, vice Jos. Thomas, resigned. Mr. Gribble was for many years foreman of the Yuba mine and of late has been superintending a mine in Tuolumne Co.

IRVING M. SCOTT has returned from Washington, D. C. He is favorable to the idea that one torpedo boat and one battle ship will he huilt here. The former will cost about $240,000; the latter over $4,000,000. It will be some weeks yet before the committee report will he made public.

W. L. AUSTIN is investigating the Empire mine, near Georgetown, Col., with a view of erecting a 250-ton smelting plant. The Empire ores have been subjected to the Fuller process at the Equator mill. By this process the ore is pulverized to a fineness of about 300 mesh and forced through quicksilver.

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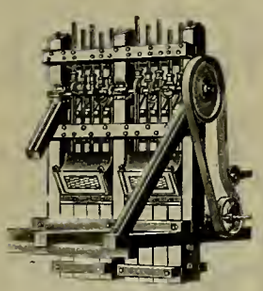

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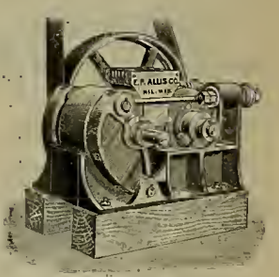
Etc., Etc.



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The McGlew Ore Concentrator Company.

PATENTED SEPTEMBER 19, 1893. CHEAPEST, SIMPLEST, MOST DURABLE AND CLOSEST SAVING CONCENTRATOR IN USE. FRANK BARRERE, Secretary and Manager

Can be seen in operation at the Company's works, 132 Main Street, San Francisco.

Office, 116 Davis Street.

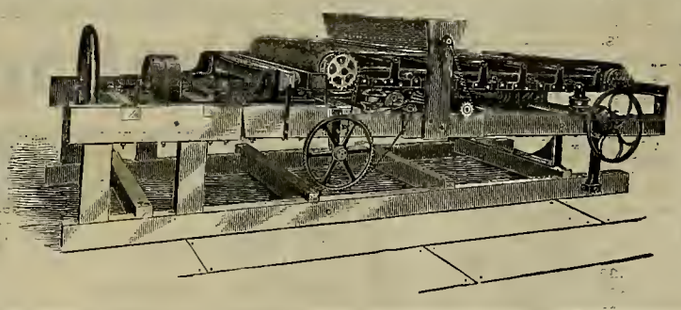
NINETY-FOUR AND ONE-HALF PER CENT
—SAVED—
ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness combining both Side and End Motion with a Bumping Belt.

SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1895.

THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works.

The Gates Ore and Rock Breaker

Gives a finer product than any other crusher made, adding by this means 25 to 30% to the output of any mill, beside saving the wear of the more costly machinery. It will reduce a given amount of ore at one third the cost in wear of any other crusher on the market. It requires also much less power for the same amount of work.

The Gates Ore Crusher

Is now being adopted by the progressive Mining Companies in all parts of the world. More than 3000 of them now running.

The Pelton Water Wheel Company, General Western Agents.

121 Main Street, San Francisco, Cal.

Scientific Progress.

Testing Precious Stones.

At a recent meeting at the Imperial Institute H. A. Miers, of the Mineral Department of the British Museum, read a paper on "Precious Stones and How to Distinguish Them." Mr. Miers confined himself rigidly to a few scientific matters, without laying claim to any artistic or expert knowledge, and simply endeavored to make it clear that gems can be easily distinguished by any one who knows the way. He said that he had always been forcibly impressed by the fact that the experts did not seem in the least aware of the simple and certain methods which had been placed at their disposal by recent mineralogical research. There was, perhaps, no subject on which experts had been so slow to take advantage of practical methods supplied by science as the manipulation and discrimination of precious stones.

Mr. Miers described these methods at some length, says *Invention*, illustrating them by means of lanteru slides, urging that they should be generally employed by gem experts. The polarizing microscope and spectroscope, he said, were easily used, and the former could be always used effectively by immersiug the stone in oil. Among uew practical methods introduced by recent discoveries were the use of the reflectometer and the recognition of tourmaline from its electrical properties by means of powdered red lead and sulphur. In place of the chemical balance for the determination of the specific gravities heavy liquids were recommended, and attention was specially called to a wonderful new liquid—fused uitrate of thallium and silver—in which all known gem stones float. Gem stones were far more numerous than was commonly supposed, although they ofteu passed muster under erroneous names. That the available varieties were uot more numerons was due mainly to the prejudice of the purchasers, who had heard of nothing but diamonds, rubies, sapphires and emeralds.

Decomposition of Water by Iron.

Iron is said to be incapable of decomposiug water at ordinary temperatures, except in the presence of air or by galvanic action, when some electronegative substance is connected with it. For this reason we should expect little corrosion from rust in the interior of a boiler, as air is only periodically admitted when the boiler is cooled down. There is, however, the dissolved air of the feed, and this is reduced in amount when the feed water is previously heated. Under any circumstance the rust found iu the interior of a boiler is of a different character from ordinary iron rust. It is, in the first place, of a much darker color. That formed in the upper spaces by steam alone is almost black, partaking of the nature of that black magnetic oxide which is formed in the Barff process by steam heated to 940° F. The latter oxide is, of course, completely protective when ouce formed, and the oxides formed in the interior of a boiler, although not of a protective nature, are, nevertheless, far less corrosive in their actiou than those formed under ordinary circumstances. This is another reason for supplying a pure feed water to steam boilers. The corrosion of the interior, when not assisted by adhesive deposits and organic acids from the lubricants, is comparatively slow, and the life of a boiler may be greatly prolonged by the exercise of care in this particular.

Edison's Latest.

The North Americau Phouograph Company, which went into the receiver's hands last Augnst, has had absolute control of the phonograph. The compauy could not pay its indebtedness to the Edison Phonograph Company and to Thomas A. Edison, and thus was forced to go out of business. Edison, as an individual, offered $125,100 for its entire assets, and the offer has been accepted. In speaking about the matter, he says: "The company has one asset which I am willing to pay a high price for—that is, a claim on all my future inventions and improvements of the phonograph. I do not care to have any one else have a lien on my brains, so I made a bid which proved higher than all others. I shall manufacture the phonographs myself now, and expect to keep all promises I made when I first introduced them. I am going in for the households, instead of nickel-in-the-slot machines, and in a short time I expect to produce an entire opera or a complete novel on a cylinder. It will cost a good deal, but it will pay me.

"I suppose it will cost me $2000 to have the opera of 'Norma' sung to the machine, bnt I can reproduce that on almost as many cylinders as I please. I think I can afford to pay more than the reporters, so that any gentleman can have 'Trilby' read to him in his parlor iu the course of an evening. I shall manufacture the perfected phonograph individnally."

Wheu asked, "What is the latest?" Edison replied: "Nothing at all, except the kinetophone, the combination of kinetoscope and phonograph. I am going to reproduce the motions and words of life-size speaking figures. I have already got a speaking and moving figure up to half life-size. Lately I have paid more attention to my mine than to anythiug else, bnt very soon I will get to work in my laboratory again."

Sir William Thomson has recently calculated that the average size of a chemical atom is not less than six and not greater than sixty billionths of a cubic inch. It has also been calculated that in a cubic inch of air there are three hundred quintillions of atoms. Heuce the cubic inch of air is by no means full, and it is possible for them to move eighteen miles a minute and collide against each other 8,500,000 times a second, as has also been lately calculated that they do.

Selby Smelting and Lead Company,
416 Montgomery Street, San Francisco.
Gold and Silver Refinery
—AND—
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HIGHEST PRICES PAID FOR GOLD, SILVER AND LEAD ORES AND SULPHURETS.
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Also Manufacturers of
STANDARD SHOT-GUN CARTRIDGES,
Under Chamberlin Patent.

John Taylor & Co.
Importers and Dealers in
Assayers' Materials,
Mine and Mill Supplies.
Also Chemicals, and Physical, School and Chemical Apparatus.
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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.
Agents of the Denver Fire Clay Co. and for the Morgan Crucible Co., Battersea, England. Also for E. G. Denniston's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.
JOHN TAYLOR & CO.
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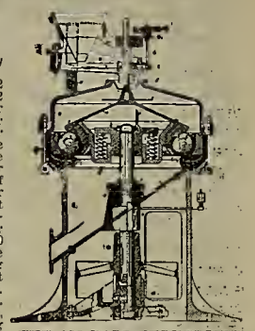
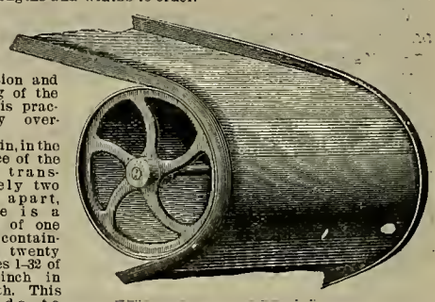
The simplest, cheapest and best machines in the market. Pulverize wet or dry to any degree of fineness. Make little or no slimes in wet nor dust in dry work. Four sizes, capacity from 2 to 60 tons per day.
SEND FOR CATALOGUE.
Cable Address, American.
First Prize and Gold Medal Awarded by World's Fair, 1893.
Office of The Cleveland Iron Ore Paint Co. and The Garry Iron Roofing Co., Cleveland, O., Jan. 25, 1894.
The American Mining & Milling Machinery Co., Cleveland, O.:
Gentlemen:—We purchased a No. 2 American Rock Breaker and a No. 2 American Ball Pulverizer from your company about one year ago. The latter part of April, 1893, we started up for regular work, since which time we have run both of said machines to the full extent of our demands and to our entire satisfaction. The first 700 tons of hard iron ore that we pulverized for paint purposes was ground without taking the Pulverizer apart, and without expending one dollar for repairs for either of these machines. Of the 700 tons spoken of, about 200 tons was Lake Superior Specular iron ore, containing some 70 per cent iron; a very difficult ore to pulverize. The remainder was a red fossiliferous iron ore, carrying quite a per cent of silex, which cuts out buhr-stones rapidly. We find that the steel balls, which were when new 5 in. in diameter, now caliper 4⅞ in., and are perfectly round and smooth. The grinding track shows very little wear, and the driving track shows less; in fact the wear is almost imperceptible. These two machines crush and pulverize more than one ton per hour with less than 12 H. P. We do not know of any Crusher or Pulverizer that can compare with the output of these two machines in quality, quality, small amount of wear and tear, and like power. In our opinion, you cannot recommend them too highly. Very truly yours,
Cleveland Iron Ore Paint Co.

THE AM. BALL PULVERIZER. Morris Patent.

Blasdel Improved Concentrating Belt.
We keep in stock belts suitable for the Frue, Triumph, Johnston and Tullock machines; and make all lengths and widths to order.
Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.
Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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419 California Street, Haywards Building.....San Francisco.

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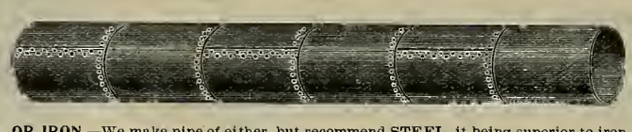
—ARE MANUFACTURERS OF—
Riveted Iron and Steel
Water Pipe
For Hydraulic Mining, Mills and Power Plants.
IRON, CUT, PUNCHED AND FORMED, AND TOOLS SUPPLIED FOR MAKING PIPE ON THE GROUND WHERE REQUIRED.
309 to 317 Market Street, San Francisco.

Mining Pipe!

STEEL OR IRON.—We make pipe of either, but recommend STEEL, it being superior to iron in many particulars and inferior in none.
COATING.—We use great care in COATING our pipe with a HOT solution of Double Refined Asphaltum and Maltha.
COMPETITORS.—Our competitors say we have the best appointed Pipe Shop on the Coast.
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SACRAMENTO, CAL.

FRANCIS SMITH & CO.,
—MANUFACTURERS OF—
SHEET IRON & STEEL PIPE
FOR TOWN WATER WORKS.
Hydraulic, Irrigation and Power Plants, Well Pipe, Etc., all sizes.
130 BEALE STREET, SAN FRANCISCO, CAL.
Iron cut, punched and formed, for making pipe on ground where required. All kinds of Tools supplied for making Pipe. Estimates given when required. Are prepared for coating all sizes of Pipes with a composition of Coal Tar and Asphaltum.

Mechanical Progress.

The Future Newspaper.

Progress in the production of newspapers during the last half century leads one to consider whether, with the fast perfecting press and the type-setting machines, perfection has been reached. The writer thinks not, but firmly believes that both press and type of the present patterns will in a very few years be things of the past.

These results will be brought about by a combination of lithography and telegraphy. The fast press printing from stereotype plates on cylinders will be superseded by an adoption of the lithographic press, also probably using cylinders; but as it would be impossible to use lithographic stone in this form, a zinc plate prepared with a coating of pyrogallic acid and gum, to enable it to hold water, will be substituted.

This is by no means a new idea, as it is well known to engravers, and it would dispose of the perfecting press in its present form; but by mounting the zinc plates type-high, with a little modification, a similar press would do the work.

The principal change would occur in the composing-room, which would feel the effects very greatly. It will not be necessary to use a line of type in the news columns. The news will be furnished in column width from the associated or other news center, printed on transfer paper, with transfer ink, by a machine something after the fashion of the present type-writing machine.

This matter will be duplicated by electricity to all subscribers simultaneously, and by them transferred to the prepared zinc plates. Electrical devices are already in use by which signatures, drawings, etc., can be made at one end of the line and duplicated at the other. It then requires only a slight stretch of imagination by those who keep track of scientific progress to realize the possibility of sending an imprint of type by the same process.

An Average Day's Work.

A day's work even for the average workman of full power, says Professor Thurston in the *Industrial World*, varies greatly with the nature of the work and the method and facilities of its performance, and the same is true of the horse and other animals, but in less degree usually.

The most powerful horses may be expected to develop, as an average, two-thirds of a horse power for eight hours a day, twelve million foot-pounds per day, very nearly, under favorable circumstances. The work of a man is variously given by different writers, but it is usually stated to be not far, at best, from two million foot-pounds a day in the treadmill, ascending mountains and stairways, when his own weight is the useful load, and carrying burdens on a level. Weisbach gives as maximum figures 1,935,360; Rankine gives 2,088,000, while Ruhlmau states the work of a Prussian soldier, carrying a knapsack and other accoutrements weighing a total of sixty-four pounds, as about 3,000,000 foot-pounds.

We may safely take two million foot-pounds per day as a figure to be compared with the ten million foot pounds of energy supplied, and as giving a fair maximum for the efficiency of the animal considered as a prime motor. It is 0.125 horse power for eight hours; 0.04 for the day.

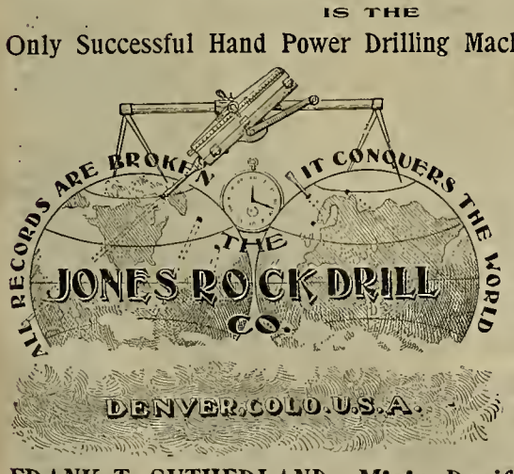
The various plans for the Berlin Exposition of 1896 are being advanced with considerable energy. The exhibition will be instructive and representative, and due consideration is being extended to the attractive side of the programme. It is proposed to build a Cairo street; the idea is neither new nor original but is likely to succeed, as special attention is being devoted to its realization. The Cairo street is intended to cover an area of 25,000 square meters, and the building materials will be of a more solid nature than are generally used for such purposes. It is also proposed to have an Egyptiau panorama and diorama. A panorama, which will be of very large dimensions, will represent the famous Ziller valley in the Tyrol. It is also under discussion to have an aquarium, a huge glass reservoir containing as many of the animals and plants of the sea as possible. The aquarium will be so arranged that it can also be inspected from the bottom. Further, there will be a captive balloon, which will possess several new features, the German military balloon department being celebrated for its ability and all its inventious and improvements will be embodied in the balloon in question. The balloon will for every ascent be fitted with a registratiou apparatus, which will register height, temperature, moisture of air, etc., also an apparatus for registering the temperature of the gas in the balloon, and experiments will be made in transferring the gas, no longer needed in the large balloon, to smaller ones. The captive balloon will be in telephonic communication with the earth and it will also carry a photographic apparatus. In conuectiou with the balloon demonstrations will be a large and varied collection of all possible exhibits connected with balloons, their handling and filling, etc.

The tensile strength of iron at 400° below zero is just twice what it is at 60° above. It will take a strain of sixty instead of thirty tons to the square inch, and equally curious results have come out as to the elongation of metals under these conditions.

THE JONES ROCK DRILL

IS THE

Only Successful Hand Power Drilling Machine Ever Invented.



It is strong, durable, reliable, simple, compact, light, easily handled and operated by one man, and will reduce the cost of rock drilling at least Fifty per cent.

Our handsomely illustrated pocket catalogue fully explains the features and workings of the drill. It should be in the hands of every mine owner, leaser, contractor and prospector in the West. *Sent free on application.*

If you are interested in Rock Drilling Correspond with us.

WE CAN SAVE YOU MONEY.

FRANK T. SUTHERLAND, M'g'r Pacific Coast Agency.

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Will supervise the Construction, Shipment or Erection of Machinery. Will make Drawings, Estimates or Specifications.
Prices obtained for machinery of every description. Twenty year's experience.
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Will examine Mines, Ore Bodies, Mineral Belts or Zones, and make written Mineralist Reports, fees for which made known upon application for services. I make my own assays and select my own samples when examining mines. Eighteen years' experience. Analysis of water and soils.

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Makes a specialty of *Mining Law.* Patents obtained on mineral and agricultural lands. *Investments and reports made.*
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Mining Operator,
ROOM 5, CROCKER BUILDING.
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Will give attention to the sale of and reporting on RELIABLE Mining Properties, or the procuring of suitable Machinery for Interest in Developed Mines.
Plans and Estimates made for IMPROVED CYANIDE PROCESS PLANTS, and competent instruction for working the same on a large, practical scale.

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Established 1869.
ORES WORKED BY ANY PROCESS.
Ores Sampled.
ASSAYING IN ALL ITS BRANCHES.
Assays of Ores, Minerals, Waters, Etc.
WORKING TESTS (PRACTICAL) MADE.
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Will examine and report upon "Title and Exact Value" of Gold, Silver, Lead, Copper, Coal, Iron, Clay or other Mineral Properties IN ANY PART OF THE WORLD. Any information mining men may desire to know, relative to the MINERAL or COAL resources of the entire Pacific Northwest, will be honestly given.
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CAPITAL, - - - £110,000 STERLING
To MINE OWNERS and others having Refractory Gold and Silver Ores hitherto untreatable at a profit, the MACARTHUR-FORREST (Patent) Process of Gold and Silver Extraction offers a solution of the difficulty.
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THE ROESSLER & HASSLACHER CHEMICAL COMPANY — CHEMISTS — NEW YORK
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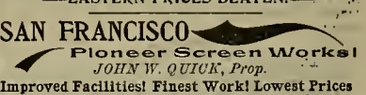
CYANIDE -OF- POTASSIUM,
Ferricyanide of Potassium,
Peroxide of Sodium,
Hyposulphite of Soda,
Sulphide of Iron,
And other Chemicals for Mining Purposes.



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Improved Facilities! Finest Work! Lowest Prices
Perforated Sheet Metals, Steel, Russia Iron, American Planish, Zinc, Copper and Brass Screens for All Uses.
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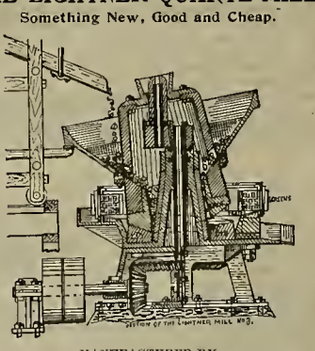
Something New, Good and Cheap.



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Bet. California and Pine, SAN FRANCISCO, CAL.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

CHARLESTON DISTRICT.

At Forty-nine Flat Boles & Hadley are running their gravel claim. The Acme mine will he started up next week.

PLYMOUTH DISTRICT.

The Alpine mine is reported sold "to rich capitalists." A two-cent assessment has been levied on the Bay State. The Pioneer mill and mine are running steadily.

JACKSON DISTRICT.

The New York Electric Company have sued Sheriff Gregory for $8000, damages alleged to have been sustained hy plaintiff in the attachment of certain electric machinery at the Gover mine. He attached the machinery with the other property, but has sold none of it.

The Kennedy Miuing Company have bought R. Atkin's interest in the Clyde quartz mine, adjoining the Kennedy ground, for $1500.

PLYMOUTH DISTRICT.

BAY STATE.—The Bay State is running north ou the 600 level and stoping out from that toward the 500. The mill runs steadily and is in free gold, pounding out a little more than expenses. They have not had any of their sulphurets treated yet.

THE GWIN—MIDDLE BAR.—The sinking continues steadily and rapidly. It is but eleven months since the workmen went on to the ground to survey and to-day the property has an excellent double-drum water power hoist which has worked without stopping almost since it was installed. The shaft of two compartments and a ladder-way is now down 650 feet. At present they are singularly fortunate with relation to the water, for they are lifting less than 3000 gallons, more than two-thirds of which is tanked at the 300 level.

Butte.

OREGON CITY.—On the Mascot a shaft is heing sunk from the lowest tunnel. Steam power will soon he in use: the shaft will he sunk 300 feet. There is more timber there now than twenty-five years ago. Then the big trees were cut down for wood required by the quartz mills, and have been replaced a second dense growth.

Calaveras.

ESMERALDA.—Preparations are heing made to work the Gum Boots mine, which has been bonded to Salt Lake capitalists. This mine is situated on Indian creek, and has been worked several years hy its present owners, Bosovich & Co., who have erected an arrastra for crushing the ore.

Madera.

FINE GOLD DISTRICT.

The ditch from the North Fork for power for the Mountain View mine is finished. The twenty-stamp mill will he huilt in the next ninety days.

Nevada.

LIVELY WORK SOON.— *Transcript:* Work of a permanent nature will soon he inaugurated at the Red Dog gravel mine, near You Bet. A tunnel will he driven to tap the channel, where good results are expected. At present the company are rewashing the old canyon tailings.

BONDED THEIR MINE.—*Transcript:* W. J. Britland and John Graves have bonded their quartz mine to San Francisco parties for $5000. The mine is situated on the hill above Delos Calkins' place, at Selhy Flat. L. P. Goldstone of Grass Valley and Mr. Bandman of San Francisco are representing the company that has the hond, and they intend to begin work soon. Samuel Blight of Grass Valley will have charge of the mine. One-fifth of the proceeds of the property will go to Britland and Graves until the purchase price is paid or the hond expires.

GETTING READY TO HYDRAULIC.—Preparations are heing made to work the Polar Star mine, near Dutch Flat, hy the hydraulic process. W. F. Englehright was over there last week surveying for an impounding dam and other work that must be done before a permit to hydraulic can issue from the Debris Commission. John Spaulding is the principal owner of the Polar Star, which in years past paid handsome dividends to the owners. With the closing of the hydraulic mines it was rendered a non-producer.

ENGLISH MOUNTAIN.—*Herald:* There is seven feet of snow at English Mountain now and it is reported that Supt. Keniston has resigned and that a competent man has heen appointed in his place.

Placer.

GENERAL MINING NOTES.—*Sentinel:* Rathburn, Johnson and Iverson are running a drift at their mine 1½ miles southwest of Blue Canyon.

W. F. Jackson, of Crocker's Art Gallery, has a claim near Blue Canyou. He has his survey made and will start a tunnel the first of this month.

H. K. Develey has a force of men driving a tunnel at his gravel claim, one mile west of Blue Canyon. Prospects look flattering and he will soon put on more men to push his tunnel to completion.

The four-stamp quartz mill of John Sipp & Co., near Blue Canyon, has been crushing ore all winter. They are working what is familiarly known as the old Red Stone quartz ledge, and they will put on more men this spring.

George and John Clark of Nevada City have honded the "Montreal" mine at Meadow Lake to parties in Salt Lake. The majority of the money has heen paid down and the balance will he paid Aug. 31. The camp of Meadow Lake will take on a new life this summer.

J. E. Shettle, who purchased the Wash ington mine in Old Man mountain last year, s ha let a contract to run a tunnel and crosscut the ledge.

AROUND OPHIR.—*Herald:* B. M. Berry has sold a three-fourths interest in the Kittler mine at Ophir to foreign parties. A contract has heen let for 200 feet of tunnel in addition to the present 100 feet. A pay chute has been struck with a streak running through it which has heen assayed hy Selhy at $451.75 a ton. The entire ledge will prohably go $60 or $70.

W. F. Whitney of Seattle has hought interests in the Coleman, Workman and Grass Ravine mining properties helow Ophir. He is also interested in the opening up of the Adams claim.

Plumas.

MINING BEGUN.—*Bulletin:* On Monday the Quincy Mining and Water Company got the water through their ditches and down to the mine. The next day one hig monitor was set to work at Gopher Hill, and in a few days others will be started. The company is prepared to operate five this year, whereas only two were in use last year. A rock dam higher than any in use last year has been constructed across Wauponse Creek largely increasing the capacity of the settling reservoir used hy the company for the storage of tailings.

This mine is now fully equipped for a long season's work. The water supply will be the hest had for years. At the hase of Spanish Peak, the source of the water supply utilized later in the season, the snow is now 14 feet deep and solid, holding immense quantities of water, which will he freed gradually as the season advances.

No compauy in this part of the State has equal facilities for cheap and effective mining by the hydraulic process, and it controls over 2000 acres of valuable mining ground located in a region which has always yielded large quantities of gold.

San Bernardino.

AT VANDERBILT.—In the Gold Bronze mine there is more ore in sight than at any previous time in the 250-foot level, there being a block of ore 200 feet long aud 100 feet high. There is also considerable ore in sight in the 150-foot level. There are twenty-three men on the payroll. A carload of concentrates averaging $60 to the ton was shipped last week.

Robert Patterson of White Hills has bought a two-thirds interest in the Phelps mine at Crescent, and taken men to work there.

San Diego.

AT PINE VALLEY.—Twenty men are employed, working night and day shifts, in J. G. Cortelyou's mines. A two-horse team takes the ore down the new mile and a half grade, keeping the five-stamp mill busy pounding out gold. Hauck brothers are developing a rich ledge, sinking a shaft which is now down over thirty feet. They will ship ten tons of ore this week to the National City reduction works.

THE RICE GOLD CAMP.—Several new strikes are reported in Rice gold camp, east of Warner's ranch. The prospects now heing developed are looking so well that mining men are showing an interest in the district. Mr. Moulton of Perris, believed to represent the owners of Good Hope mine, has acquired control of the Hillside and Pine Ridge mines at Rice, and, in company with Foreman McGeary of Warner's ranch, is developing the properties by sinking a shaft, running a tunnel and making arrangements for a mill. The Bertha and Daisy, owned hy Harrison and Rice brothers, are showing extra good rock.

Shasta.

FRENCH GULCH.—*Free Press:* Ellery brothers, who cleaned up over $1500 from twenty tons of ore last week, are still doing business on the same lines, and will clean up $2000 this week. Their sulphurets also assay up in the hundreds.

The Gladstone is working the usual force of men and will probably show a net profit of $8000 for the past month, as against $5500 for the preceding month.

The Washington still runs steadily, and the hullion shipments are heavy. Late developments in the mine are a surprise to the owners.

The Niagara shows good results.

Considerahle prospect work is heing done on several mines near the Tower house.

TRINITY CENTER.—Several large placer deals are reported in a fair way to consummation.

A French Gulch syndicate are the reported purchasers of Jack Strode mine. This mine shows a fine lot of ore chutes milling from $50 to $100 per ton. The five-stamp mill will he increased to ten.

CINNABAR.—The Altoona is working along quietly. It is understood that their product from one furnace aggregates ten flasks daily. The snow is from fifteen to twenty feet deep.

THE BASE RANGE.—The property of Butler & Sons, under bond, is heing developed by a San Francisco syndicate.

Near Kennet a new discovery of low grade gold ore is reported.

At Squaw creek a new combine is reported to be examining the Riley mine with a view of purchase. They think that by spending from $25,000 to $30,000 the property can be made productive.

The Uncle Sam mill and mine dump over a hundred tons of tailings into Squaw creek daily and send out a corresponding amount of hullion. No stops or hitches occur in this management. The large ore reserves and dead work insures an ore supply for a year to come.

The owners of the Balla Klalla at Windy camp are trying to float their properties in Philadelphia. A small force of men are at work under Colonel Ellis and Weil.

IRON MOUNTAIN.—The surveyors are still setting stakes for the new railroad. It looks as though the hills would be denuded of timher making stakes for various surveys. The right of way has been secured across several pieces of property, hut there is no telling when the surveyors will get through. Copley seems to be the terminus decided upon. The Iron Mountain mill has been thoroughly overhauled and is ready to run as soon as wood can be obtained. This week there were eighty-one men at work in various capacities about the mill and mine.

The Power company started their men clenring brush and setting stakes last week in the canyon above the Calumet on Spring creek. Four hundred electric horse power will be dcvelcped and turned into electric energy to be rented out to the various mines in the vicinity.

MISCELLANEOUS.—The Kosciusco has ten stamps pounding away and the miners are at work in the tunnels.

Redding parties have secured a bond on the Afterthought and Donkey mines at Furnaceville, and will undoubtedly create a boom in that district.

The Tellurium mine on Salt creek is getting in their new machinery, putting in tramways, etc.

Charles Jones and Hans Christisen's new mill at Muletown is to be supplied with a large eugine and boiler. It is now grinding from four to five tons daily.

Bullychoup is still covered with snow at least twenty feet deep.

NEVADA.

Storey.

SAVAGE AND CHOLLAR.—In the Savage, on the 950-foot level, the south drift started from the face of the sill floor, southeast drift, was advanced 22 feet; total distance, 80 feet, at which point it connected with an upraise from the 13th floor of the south ore stopes. This connection gives good ventilation and enables them to prospect this section of the mine advantageously.

During the week most of the men have been employed in repairing and retimbering the main hoisting shaft between the 850 and 950-foot levels.

The bullion statement of the Chollar for March is as follows: Worked at Nevada mill 820 tons of ore; gross proceeds in bullion, $19.661; cost of reducing, $4,920; net proceeds in bullion, $12,277; assay value per ton, $27.76; gross average per ton, $23.98; net average, $17.98. Mill worked 88.2 per cent.

OFFICIAL REPORTS.

CROWN POINT.—The east crosscut from the south lateral drift on the 700-foot level, 105 feet south from the shaft, is now out 52 feet. It has been stoped, and they are now preparing to raise from it in the quartz, the latter ruuning from $5 to $8 per ton hy face samples. It is the intention also to run north from fourth floor of the stope to connect with this raise, which work will be started within a day or two.

Have extracted during the past week from the openings on the 600-foot level and between it and the 700-foot level 514 tons of ore, which has been shipped to the Mexican mill for reduction. The hattery sample for the week has averaged $10.41, of which $9.31 was gold.

Have shipped to the Carson Mint one har of hullion valucd at $17,135, the cleanup for March.

BELCHER.—On the 300-foot level the joint Belcher and Seg. Belcher south drift is now 31 feet from the Belcher shaft, and the face shows porphyry.

Hoisted during the week and stored in the ore hin at the mine 38 tons of ore, the average top car samples of which show an assay value of $35.12 per ton.

SEG. BELCHER.—On the 200-foot level the main south drift is in 464 feet from the Belcher shaft, having been advanced 10 feet. The face shows porphyry.

Have hoisted during the week and stored in the orehouse at the mine 12 tons of ore, the average top car sample of which shows an assay value of $49.64 per ton.

ARIZONA.

HARQUA HALA DISTRICT.

CARGO MUCHACHO.—*Times:* The Paymaster mill will soon commence running again on ore from the Padre, located a mile and a half from the mill. An eighty-foot shaft has developed a good hody of ore.

SALE OF THE OLD DESERT.—John Llewellyn and C. J. Kimhall disposed of a hond on the Old Desert mine to James Wakeman of Connecticut, retaining a one-third interest in the property. They bonded the mine three months ago. The Old Desert lies eight miles north of the Bonanza. It was located about twelve years ago and a great deal of work has heen done on it since. There is said to he now not less than 200,000 tons of ore in sight. The ore is partly free milling, partly concentrating and very rich. A mill will be erected at once. Enough power will be arranged to run a 60 or 100 stamp mill, though so many stamps will not he employed in the beginning.

THOMAS CAMP.—The shaft on La Fortuna is now down twenty-five feet and the six-by-eight opening is all in ore, with the hanging wall not yet in sight. Twelve tons of ore are sacked ready for shipment, which, it is estimated, will go from $100 to $200 per ton. There are on the damp seventy-five tons. About twelve ounces of free gold have been concentrated from the refuse. The New Year's Gift is being opened up hy Wm. Halbert and shows free gold in horn from croppings.

The country is granite, porphyry, schist, shale and quartzite. The footwall is quartzite, schist and shale in gangue. Porphyry shoots up through formations and granite predominates as the contact. Veins run with the country. White spar and white quartz cap and shoot through almost all formations, also run through the hills regardless of lay of country. In the Providence and La Fortuna gold has been found in the schist.

REPORTED BONDED.—*Journal-Miner:* It is reported that the famous Bullard mine in the Harcuvar mountains has been bonded for $500,000. It is to he hoped the report is true, for this is one of the largest and hest mines in Arizona, and will doubtless be worked on a very large scale, giving employment to a great number of men and putting a large amount of money into circulation. This mine is only about twenty-five miles from Congress station, S. F. P. & P.

CASTLE CREEK DISTRICT.- Supt. Lindsly of the Whipsaw Mining Company has the ten-stamp mill owned hy the company ruuning day and night. The ten-stamp mill of the Swallow Mining and Milling Company is in full operation, and K. Barrett has his mill on the Trade Mark running a considerable portion of the time.

THE MARICOPA COPPER CO.—Phœnix *Herald:* Out of the debris of the wreck of the Harcuvar Copper Company, owning extensive mining properties in this and Yuma counties, there has sprung a new company known as the Maricopa Copper Company, organized under the laws of Illinois. The new company is composed of members of the old company, who have sufficient faith in the properties controlled to develop and work them. Frank Prange, of the new company, is now in Phœnix making arrangements to start up the copper properties, and soon men will be at work and stamps dropping on the ore.

BRITISH COLUMBIA.

OWN TWO MINES.—The Great Western Mining Company was incorporated on the 1st inst. under the laws of the State of Washington, with a capital stock of $1,000,000. The directors of the company for the first six months are John M. Burke of Cœur d'Alene county, Idaho, Chas. S Warren of Butte, Chase Barr of Rochester, Ill., and D. M. Drumgeller, Jarvis R. Jones, H. M. Stephens and Louis E. Bertonneau of Spokane.

The company is the owner of the Great Western and Gold Chariot gold mines at Trail Creek, B. C. The ore of the Great Western property is like the Wnr Eagle and is about four feet in width. The shaft on this property has only reached a depth of twenty feet, all in ore, and it is expected when the contract now let reaches the 100-foot, levels will he extended each way on the lead. Work will be started on the Golden Chariot as soon as the Great Western contract is finished.

COLORADO.

RAPID DROP STAMPS.—*Ores and Metals:* The new rapid-drop stamp mill of the Iron City Mill Company in Black Hawk is about completed, and will be started up this week or the week following on custom ore. It will have a capacity of twenty-five stamps, equivalent to fifty stamps of the slow-drop style.

IDAHO.

WALLACE DISTRICT.

THE MAMMOTH MINE.—The Mammoth mine, which C. L. Hathaway is operating in Pony gulch, near Delta, is employing a dozen men. Mr. Hathaway is satisfied with his experiments with the Crawford mill, which he put in thero, and has just shipped another over to the mine. The ore runs from $112 to $170 per ton in gold. The property consists of a blanket deposit, which is explored hy half a dozen tunnels ranging in length from 150 to 190 feet. The Crawford mill is supposed to treat ten tons per day with a 200-mesh screen, hut at the Mammoth thirteen tons per day are put through a 100-mesh screen, which is as fine as they require it.

RUN HIM OUT.—Last Saturday J. Mills was run out of the Gem mine hy six masked men, all armed with revolvers. He was drilling a hole in a raise with one companion, and the leader of the gang had him covered with his gun before he saw them. Three of the men arranged themselves ahead of him and three behind, and in that way he was taken out of the mine. No arrests have been made. Mills is one of the pioneers in the Cœur d'Alenes.

MONTANA.

A seventy per cent interest in the Minnie, the Minnie Extension and the Great West gold properties, located in the Natural Bridge district, twenty-five miles south of Livingston, has been bought hy Paul Zuber for $7,500. This property is now owned by Zuler and Thompson Bros., of Livingston, who expect to begin mining operations on all three mines early in the spring. A stamp mill is to he erected and development work pushed during the summer.

THE GILT EDGE.—*Inter-Mountain:* The Gilt Edge, in Ferguson county, is shipping gold hullion twice a week, averaging about $3500 per week. The ore averages $30 a ton, and the company is putting through about forty tons a day. The tailings are run down to from ten to sixty ccnts a ton.

OREGON.

BLACK SANDS.—The St. Paul men who are working the hlack sand deposits on the heach north of Bandon are putting in two new machines for extracting the gold, and are highly elated over their success in handling the sand.

IN GRANT CO.—Thomas Jones, John Stam and Aaron White are opening a new quartz mine on the headwaters of Wolf creek, about twenty miles southeast of Prineville. They have run an open cut on the ledge a distance of 120 feet, and are now twenty feet below the surface.

UTAH.

BEAVER LAKE DISTRICT.—H. Joseph has signed the hond of the Banty claim in Beaver Lake district to Captain J. R. De Lamar. The bond is for $20,000, and is for six months. De Lamar has contracted with Joseph and Douglas for fifty feet of shaft.

TWO MINING DEALS.—Capt. J. R. DeLamar has hought a half interest in the Golden Gate group and other properties adjoining the Mercur. The property covers fifty acres of surfaoe. The ores run from $9 to $15 per ton in gold. The ores are very refractory and volatile. Reduction by roasting showed a loss of 22 per cent, while chlorinization gave a

loss of 34 per cent. A check on Wells, Fargo & Co. for $35,000 is reported to have been passed over as the first payment.

In addition to the half interest in the Golden Gate group, Capt. De Lamar also purchased a half interest in the lease and bond now held by Messrs. Butts and Neill on the Viking group, adjacent to the Goldon Gate, and covering fifty acres.

The properties thus acquired by Capt. De Lamar in the Mercur district give him an interest in the gold belt covering more than one hundred acres, and is a larger property than the Mercur itself. For the present nothing but development work will be done. George Kislinghury, formerly State Mine Inspector for Colorado, and an old miner and journalist, will take charge of the works.

Capt. De Lamar will spend the summer cruising on his yacht.

DE LAMAR'S PROCESS.—The De Lamar *Lode* gives the following description of Capt. De Lamar's new cyanide mill, in which he has adopted a process of his own, and which may be used in the Golden Gate:

"The ore, which is deposited by a tramway into a fifty-ton bin, goes to the platform, where the labor of one man is required to put it through the rock-breaker, and it is then conveyed on to the dryer. From this it is taken by an elevator to two hoppers, from where it is fed into the rolls and then conveyed by another elevator to the screens. In the rotation of the screens the coarse material drops back into the rolls, while the fine material passes on through a patent self-sampler and on to a self-weigher, a personal invention of Mr. Cohen's. It is then conveyed to the roaster; and, after being treated here, it goes through the cooling process and into bins, from where it is emptied in five tanks and treated with chlorine gas, where it stays for a certain length of time, and is then emptied into the precipitating tanks below. All of the work is performed by machinery, and it was demonstrated by the first run that, without forcing the work in any division, ten tons more material could be put through than was expected. The capacity of the mill is fifty tons, and the first report gave ninety-eight as the working percentage. The entire plant covers about three acres, and every enclosure has a corrugated iron roof, while the lining of the precipitating tanks alone contain twelve tons of lead. In connection with the works is one of the most complete assay offices to be found in connection with any mill, a fully equipped machine shop and electric-light plant, with one of the finest offices in the Western country. In the erection of the buildings every precaution was taken against fire, as, in addition to the large storage tanks which are connected by pipe, there is a large pump in the main building. There are also electric signals in all parts of the mill by which the machinery may be started or stopped in an instant and alarms given. The whole structure, which is an exhibit of mechanical skill, with a continuation of the present success, will be the salvation of Ferguson district."

GOLDEN GATE GROUP SOLD.—Captain De Lamar has closed a deal for a one-half interest in the Goldon Gate group of mines in the Camp Floyd district. The price, it is said, is $35,000, with the option to take the remaining half interest at $40,000.

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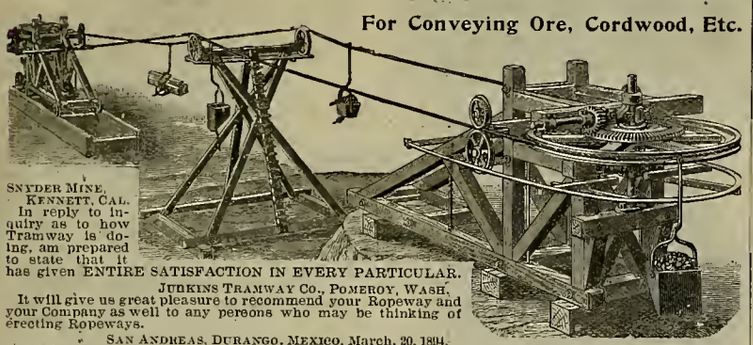
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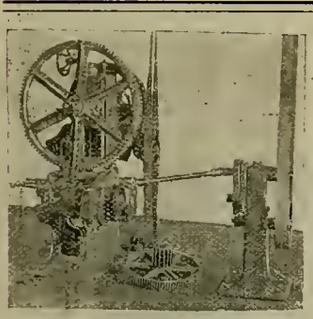
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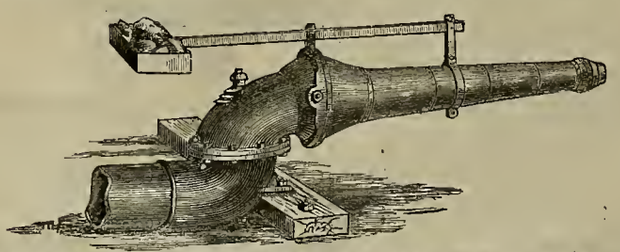
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Prof. F. B. Crocker, of Columbia College, is an electrical scientist whose utterances are entitled to some attention. Regarding the probability or possibility of controlling the weather by means of electricity, to "make rain," or cause fine weather, the Prof. says:

"It is difficult for the most conservative man to set any bounds to the possibilities of what electricity will one day accomplish. Of course, there is one great fallacy in the popular mind, and that is that we know very little about electricity. On the contrary, we know a great deal. Electricity is to-day one of the most exact of all the sciences. On the other hand, it is perfectly fair to say that we have hardly begun to put this agency to the various uses which will be made of it in the future. In a word, while we know a great deal about it, we have only just begun to perfect mechanical devices for applying and utilizing it.

"I do not know that it would be at all impossible to make rain by electricity. The discoveries of Lord Rayleigh and Prof. Oliver Lodge are very well known to science, and have led to many interesting experiments. For example, a current of electricity applied to a broken or interrupted jet of water will make the stream perfectly smooth and continuous. One great difficulty in making rain by this means would be that of securing an effective discharge of the fluid. However, it might be feasible to send up a balloon from which could be suspended a large circular ring, with a large number of sharp points sticking outward, and connected by a fine wire with a high-tension dynamo or influence machine below. Whether this would secure the desired end, I am not sure, as air, you know, is a very bad conductor. It is a thing that would have to be exhaustively tested by actual experience. Perhaps the greatest difficulty to overcome would be that of effecting the discharges of electricity in the proper places and at the desired altitudes.

"I think it is entirely probable that within another decade we shall have solved practically the question of aerial navigation. Not that this problem is so very easy; but it presents no more difficulties than hundreds of other similar mechanical problems have, and there is no more reason to suppose that we shall not build a successful air ship than there was reason to suppose a hundred years ago that steam could not be applied to the propulsion of a train of cars along a smooth track or of a ship across the ocean. And, of course, if we get an air ship that can be easily operated, and will carry a considerable weight, then it will be very easy to load a ship with storage batteries containing a big electrical supply, sail up into the clouds, and discharge the electricity wherever we want it. In a word, if it is found that we can make rain by an electrical discharge, and we want to do it, it will not be very long before we shall find ways and means of doing it.

"Of course, it would still remain to be seen whether there is actually enough moisture in the arid areas of the great West to precipitate a considerable rainfall.

"I do not know that I clearly understand the suggestion as to utilizing the heat of the tropics to modify the temperature of colder climes. The suggestion may be simply to utilize the heat of the sun's rays by means of a solar engine for the creation of electricity. This could be transmitted long distances. You know in the tropics, where the sun's rays are intense, the solar energy develops a force of about one horse power to each square yard of the surface exposed. Inasmuch as the sun's action is very nearly continuous in the day time, and but a little interrupted by clouds, this force is fairly reliable.

"But it seems to me there may be a much simpler device than this for modifying the climate. The simplest device would be to pump hot air from the tropical zone and cold air from the region of the Arctic circle. It would not be difficult, nor would it be very expensive, to construct a steel tube system of sufficient diameter to somewhat modify the climate of the Eastern seaboard.

"For example, a thin steel tube, say four or five feet in diameter, would convey an enormous quantity of air. One has really no idea of what this quantity would be until one stops to figure it out.

"The idea is identical with the pipe-line systems now in use. Oil is piped long distances from the oil wells of Pennsylvania, and, similarly, natural gas is piped long distances. Now, it would be just as easy and just as feasible to pipe air as oil or gas.

"The distance, too, is not so very great. I have been surprised to find how short a line would serve for this purpose. If it extended from within the tropical zone to within the Arctic zone, it would more than meet the requirements and still extend over only an eighth of a circle. It would be only about three thousand miles long. I do not think that it would require a pipe of more than four or five feet in diameter, and the pipe could be built of thin steel and need not be expensive. Such a line would not be nearly so costly to build and equip as a railroad line, nor does it present any material difficulties. It would be the simplest of mechanical problems, and the 'right of way' would not be expensive.

"For motive power some out-of-the-way waterfall could be utilized, so that the expense of operation need not be very great.

"I know all such suggestions as these are generally looked upon as coming from a wild-eyed lunatic; but there is really nothing half so daring in this suggestion as was the idea of laying a cable under the Atlantic. The difficulties to be overcome were greater then than any difficulties with which this enterprise would meet. We go to a great deal of expense to secure pure water. I don't see why it would not be just as feasible to provide means for fresh air and at the same time modify the rigors of our climate. Of course, the original heat or cold might be lost in transmission, but the air would always produce heat where it is compressed and cold where it expanded."

There are thinkers and dreamers in every branch of science and progress. Edison, Tesla and Bell show what thinkers can do. The gentleman interviewed above seems to belong to the class of dreamers.

It is said that since the introduction of the electric light, public performers are able to preserve their voices in better condition, being fifty per cent more often in good voice. They are cooler, do not perspire, and do not get husky.

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JAMES H. LANCASTER, Patentee,

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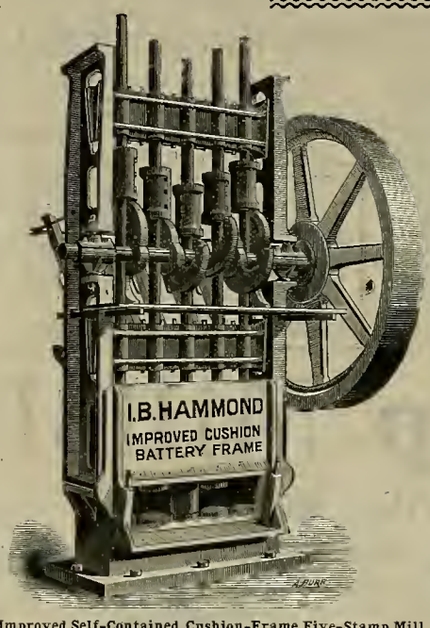

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SECOND: The Saving in Mill-Wright and Mechanics' Labor in Framing and Erecting.

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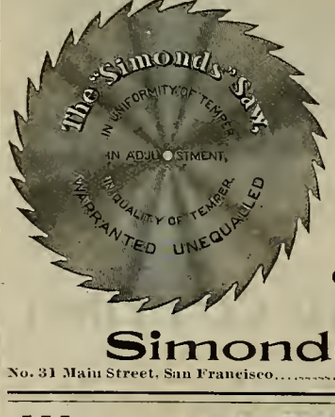

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Points on Patents to Mines.

The recent decisions of the United States Land Office say in effect: Abandonment in its common law sense is purely a question of intention. An abandonment takes place when the ground is left by the locator without any intention of returning or making further use of it, independent of any mining rule or regulation.

Failure to perform the amount of work on a mining claim required by the local mining laws or regulations established and in force in the district where the claim is located amounts to an abandonment of the claim, and consequently it may be occupied and appropriated by another.

Foreign companies cannot set up an adverse claim to an unpatented ground.

If a joint owner of a claim is excluded from the notice of location, he has such an adverse interest as to entitle him to file an adverse claim.

When one is seeking a patent, and gives the required notice, any other claimant of an unpatented location objecting on account of extent, of form, or because of prior location, must come forward with his objections and present them, or he will thereafter be precluded from objecting to the issuance of the patent.

In the absence of a law to the contrary adverse claims may be filed on Sunday, or out of office hours, if the officers are willing to receive them, though they are not required to receive adverse claims or transact other business, except during regular office hours.

While the right to a patent is equivalent to a patent issued, yet the purchase of lands containing minerals under laws governing the sale of agricultural lands does not vest any rights whatever in the purchaser, for mineral lands are reserved from sale, and if no right to patent exists, it follows that a patent cannot be legally issued.

No distinction is made by the mining laws in the matter of location, occupation and appropriation of mining claims between the rights and privileges of a citizen and those of a person who has declared his intention to become a citizen.

Tellurium.

Any miner or prospector who has a blow pipe, alcohol lamp and a few drops of cold sulphuric acid, can, in a few minutes, determine whether tellurium is present in ores. All that is necessary is to break off a small piece of the ore, place it in a small porcelain dish previously warmed so as to avoid breaking, apply the blow pipe until the ore is at an oxidizing heat, then one or two drops of sulphuric acid on porcelain dish; allow to mix with the ore. The reaction will immediately follow, if tellurium is present, by beautiful carmine and purple colors.

Characteristics of Tellurium:—Tellurium is rather a rare element and was first discovered in 1782 by Muller von Reichenstein. The compact form is a silver-white resplendent metal of markedly crystalline structure. The crystals are rhombohedra and the ingot consequently is very brittle. Specific gravity is 6.2. The metal fuses at about 500° Centigrade and is distilled at a very high temperature. Its vapor is golden yellow and has a very brilliant absorption spectrum. A bar of tellurium becomes feebly electrical when rubbed with a woolen cloth. The electrical conductivity, like that of selenium, is largely influenced by the temperature previous to heat, and it increases after exposure to light, though not to the same extent as selenium does. Tellurium burns when heated in the air with a blue flame, evolving white vapor of tellurium dioxide. It is insoluble in water and carbon disulphide, but dissolves in cold fuming sulphuric acid, imparting to the solution a beautiful carmine color which almost immediately gradiates into a purple, that is probably due to the formation of a compound analogous to sulphur sesquioxide, namely STO_3, the tellurium being precipitated on the addition of water. On heating the sulphuric solution, the tellurium is oxidized, sulphur dioxide being given off. In the same way, it rapidly undergoes oxidation in the presence of nitric acid.

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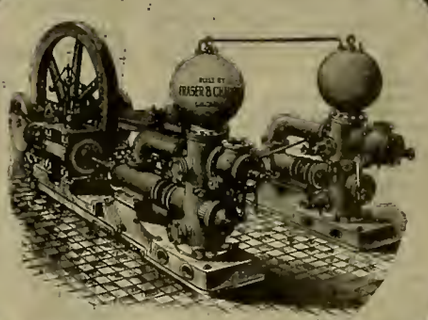

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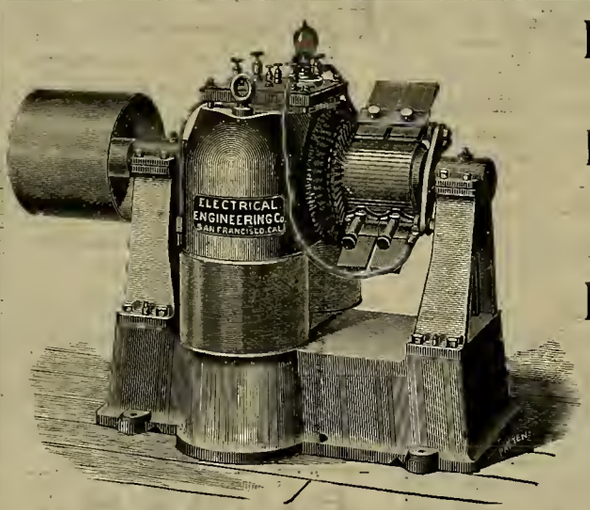

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Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us enables us to give advice which will save inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 220 Market St., S.F.

Market Reports.

The Markets.

SAN FRANCISCO, April 11, 1895.

The weekly see-saw in silver sends it back to just the figures of a week ago. But like the toad that climbed four feet every day and fell back two feet every night, it will get out of the hole.

The following special from London contains some interesting information concerning the hi-metallic sentiment of the Australian colonies: "The Australian colonies have instructed their Agents-General to urge upon the British Government first, to permit each colony to be represented directly in any international silver conference that may be called, or if that may not be considered advisable, that the colonies conjointly may be allowed direct representation."

This important fact, which is learned upon authority, has not yet appeared in the London press. Agent-General Playford of South Australia has sent a letter to this effect to the Marquis of Ripon, the Colonial Secretary, but has not yet received a reply.

Several of the colonies, notably South Australia, produces silver, but while their own mints are allowed to coin gold, all receive their silver coin from the Imperial Mint in England.

New York Metal Market.

NEW YORK, April 11.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50c.

COPPER—Brokers', 9.87½c; exchange, 9.40c.

LEAD—Brokers', $3.05; exchange, $3.12½.

TIN—Straits, 14.20c.

SPELTER—Domestic, $3.20.

New York Silver Prices.

NEW YORK, April 11.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	29⅞	65⅝	9 40	
Saturday	29⅞	65⅝	9 35	3 12½
Monday	30⅛	66¼	.....	.....
Tuesday	30⅛	66⅞	.....	.....
Wednesday	30⅝	66½	9 37½	3 12½
Thursday	30½	66¾	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum.....7@8
Commercial Loans, prime.....6@8
Call Loans, gilt edged.....7@8
Call Loans, mixed securities.....7@8
Mortgages, prime, taxes paid by lender.....7
New York Sight Draft.....7½c
New York Telegraphic Transfer.....10c
London Bankers' 60 days.....$4.88¼
London Merchants.....$4.86
London Sight Bankers.....$4.90
Refined Silver, per ounce.....63¾c
Mexican Dollars, nominal.....54@64½

San Francisco Metal aod Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	6 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
NAILS.			
Wire			$2 90
Cut			2 65
PIG TIN.			
Per lb	15	@	16 00
ZINC.			
Sheet	8¼@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —

Mining Share Market.

SAN FRANCISCO, April 11, 1895.

The Comstocks opened weak, and every stock showed that despite the advance in silver, the encouraging official reports from the mines and the plentitude of money, the lack of leadership prevented anything like business on the street. There was an advance on Wednesday that a little nerve could have and would have sustained.

The following illustrates the changes of the week:

MINES.	4	11
Alpha	.....	10
Alta Consolidated	$ 29	.....
Andes	.....	$ 28
Belcher	42	65
Best & Belcher	82	86
Bodie	1 40	.....
Bullion	22	22
Challenge	44	44
Chollar	58	56
Confidence	.....	.....
Consolidated California and Virginia	2 80	2 85
Consolidated New York	.....	.....
Crown Point	42	38
Exchequer	04	.....
Gould & Curry	52	.....
Hale & Norcross	1 40	1 35
Justice	16	.....
Mexican	84	85
Ophir	1 65	1 70
Overman	.....	14
Potosi	58	54
Savage	39	38
Sierra Nevada	83	84
Union	54	54
Utah	06	.....
Yellow Jacket	61	55

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Belcher S M Co, Nev	50	25c	Mar 5, Apr 9, Apr 30	C L Perkins, 309 Montgomery
Booth G M Co, Cal	5	2c	Feb 18, Mar 25, Apr 17	Geo R Spinney, 310 Pine
Brunswick Con G M Co, Cal	8	2c	Mar 20, Apr 20, May 15	J Stadtfeld Jr, 309 Montgomery
Bullion Con G M Co, Cal	1	10c	Feb 19, Mar 25, Apr 25	C A Grow, Mills Building
Challenge Con, Nev	18	5c	Feb 19, Mar 26, Apr 16	C L McCoy, Mills Building
Con New York, Nev	18	5c	Feb 19, Mar 26, Apr 17	Chas E Elliott, 309 Montgomery
Crown Point G & S M Co, Nev	65	25c	Mar 12, Apr 16, May 7	Jas. Newlands, Mills Building
Gray Eagle M Co, Cal	39	5c	Mar 2, Apr 8, Apr 26	A P Swain, 309 Montgomery
Iowa M Co, Nev	20	5c	Mar 6, Apr 9, Apr 27	R L Thomas, 419 California
La Candelaria M Co, Mex	8	$2	Mar 7, Apr 9, Apr 27	G A Hill, 22 Market
La Grange H M Co, Cal	10	35c	Feb 23, Apr 1, Apr 22	A Helsey, 328 Montgomery
Occidental Con M Co, Nev	18	10c	Mar 20, Apr 23, May 15	A K Durbrow, 309 Montgomery
Ophir S M Co, Nevada	65	25c	April 4, May 7, May 27	E B Holmes, 50 Nevada Block
Osborn Hill G M Co, Cal	4	25c	Feb 27, Apr 4, Apr 24	R R Grayson, 331 Pine
South Eureka M Co, Cal	17	1c	Feb 20, Apr 1, Apr 22	A Helsey, 328 Montgomery

San Francisco Stock Board Sales.

SAN FRANCISCO, April 11, 1895.

9:30 A. M. SESSION.

200	Andes	28	400		36
100	Belcher	65	200	Mexican	85
400	Best & Belcher	86	350	Ophir	1 70
100	Bullion	22	300	Overman	14
100	Chollar	56	350	Savage	38
200		55	100	Seg Belcher	20
100	Hale & Norcross	1 35	50	Sierra Nevada	84
100	C. C. V	2 80	300	Union	54
450		2 85	100	Yellow Jacket	55
50	Crown Point	37			

SECOND SESSION—2:30 P. M.

100	Alpha	10	850	Crown Point	38
100	Andes	28	50	Mexican	84
200	Belcher	65	200	Ophir	1 60
100	Caledonia	10	100		1 65
50	Challenge	44	600	Occidental	15
300	Chollar	54	200	Potosi	54
50	Con Cal & Va	2 80	50	Union	53
100		2 85	400	Yellow Jacket	53

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING APRIL 2, 1895.

536,982.—TREE PROTECTOR—C. W. Anderson, Los Angeles, Cal.

536,683.—FLOATING DOCK—J. J. Cousins, S. F.

536,610.—DOOR CASING—E. G. Durant, Pasadena, Cal.

536,721.—REFRIGERATOR CAR—J. M. Gilstrap, Sacramento, Cal.

536,927.—FIRE ESCAPE—J. L. Gregory, Washoe, Nev.

536,874.—EXHAUST NOZZLE—E. W. Harris, Palisade, Nev.

536,876.—STUMP PULLER—E. W. Jones, Portland, Ogn.

536,754.—SOCKET WRENCH—E. E. Masten, Sacramento, Cal.

536,756.—DREDGER—C. Meier, S. F.

536,757.—LAMP STOVE—W. R. Myers, S. F.

536,893.—AMALGAMATOR—N. L. Raber, Corvallis, Ogn.

536,704.—CAR SAFETY GUARD—G. Rischmuller, S. F.

536,842.—WATER MOTOR—R. C. Shepherd, Redlands, Cal.

536,767.—UMBRELLA AND FAN—M. Stocklmeier, Los Gatos, Cal.

536,822.—SAW HANDLE—John Tors, Fort Bragg, Cal.

536,769.—FLUSHING DRAIN PIPES OF SINKS, ETC.—F. B. Vinter, San Jose, Cal.

536,770.—FLUSHING DRAIN PIPES OF SINKS, ETC.—F. B. Vinter, San Jose, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

REVERSIBLE SOCKET WRENCH.—Egbert E. Masters, Sacramento, Cal. No. 536,754. Dated April 2, 1895. The object of this invention is to provide a tool which is adapted to fit and turn nuts or bolts having various sizes and shapes of exterior, and also to provide a socket which is adapted to receive a drill, screw-driver, countersink or other tool, with a means for advancing the tool independent of the socket. It consists of head-plates through which a hollow socket extends, said socket having a ratchet fixed to and turnable with it between the plates, and pawls pivoted upon each side, adapted to engage the ratchet teeth upon opposite sides, so that by engaging one, and disengaging the other, the ratchet may be turned in either direction, and a ring or sleeve surrounding the shank or handle and turnable thereon, said ring having a cam-shaped slot in the inner side by which either of the pawls may be allowed to engage with the ratchet while the other is disengaged.

LAMP STOVE.—W. R. Meyers, San Francisco, Cal. Assignor to W. W. Montague & Co., same place. No. 536,757. Dated April 2, 1895. The object of this invention is to combine with an exterior metallic casing, and a removable central draft lamp adapted to be suspended therein, an unperforated conical directing plate, either with or without a supplemental canopy, so that the air from beneath is directed over the upper part of the lamp body and concentrated toward the draft openings of the lamp proper, and the chimney therefor; and in conjunction with this is employed a sliding segmental reflecting door whereby the front of the stove may be opened or closed, and supplemental draft openings which are in use when the stove is thus closed.

CONNECTION FOR FLUSHING DRAIN-PIPES OF SINKS, WASHBASINS, ETC.—Fred. B. Vinter, San Jose, Cal. No. 536,769. Dated April 2, 1895. The object of this invention is to provide a simple and readily adjustable means for connecting a flushing or forcing pump with the drain or the waste pipe, whereby the latter may be cleansed or opened out when clogged, in an easy, thorough and effective manner, the work being done by one man instead of two ordinarily employed. The device consists of a plate or base adapted to fit within the vessel directly over the mouth of the drain or waste pipe, said plate or base having an internally threaded opening, and a washer or gasket under it to form a tight joint; means for securing and tightening the plate or base to its seat, and an internally threaded nipple fitted to the base and adapted to be screwed to the internally threaded opening thereof for the attachment of the hose of a force pump.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient to pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

PUMPS!

SEALED PROPOSALS

Will be received by the CITY OF SACRAMENTO, CALIFORNIA, until MAY 1, 1895, for furnishing and constructing

HIGH DUTY PUMPING ENGINES,

One (1) having a capacity of 5,000,000 gallons per twenty-four hours; the pump to be of the vertical triple expansion or cross-compound type.

The bid to include air pumps, valves, feed pumps, piping and all other appurtenances pertaining to a pumping plant, excepting boilers.

Steam-pipe connections must be made and furnished by contractor, also connections made and furnished to suction and mains.

The city to furnish concrete foundation for pump and build pump house.

Specifications may be obtained at the office of the City Clerk.

O. S. FLINT, City Clerk.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from David Croft, in the Gold Deposit mine, near Kelsey, El Dorado Co., to deposit tailings in an old hydraulic pit; from Wm. F. Coe, in the Railroad Placer Mine, near Placerville, El Dorado Co., to deposit tailings behind dams in Spanish Flat Ravine; from J. C. Day, in his mine near Georgetown, El Dorado Co., to impound tailings in an old hydraulic pit; from John A. Browles, in the Independence Mine, near Brownsville, Yuba Co., to impound tailings behind a dam in Letson Ravine; from Wm. Heming et al, in the Iowa Mine, near Forest Hill, Placer Co., to impound tailings behind a dam in a ravine; from Jas. Ward & Wm. McDonald, in the Tiger Mine, near Forest Hill, Placer Co., to impound tailings behind a dam in a ravine; from Jos. J. Hoffman et al., in the Hard Times Mine, Bath, Placer Co., to impound tailings in an old hydraulic pit; and from Wm. & Wm. J. S. Bacchi, in the El Dorado Placer Mine, Garden Valley, El Dorado Co., to impound tailings in ravine below the mine, gives notice that a meeting will be held at Room 92, Flood Building, San Francisco, on April 22d, 1895, at 1:30 P.M.

TUBBS CORDAGE CO.
(A CORPORATION.)

Constantly on hand a full assortment of Manila Rope, Sisal Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc. ☞ Extra sizes and lengths made to order on short notice

611 and 613 FRONT ST., San Francisco, Cal.

Assessment Notices.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Grass Valley Mining District, Nevada County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 20th day of March, 1895, an assessment (No. 8) of Two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, Nevada Block, San Francisco, California, or to the Treasurer, J. J. Halpin, 57 Broadway, room 87, New York City, State of New York, on or before the 20th day of April, 1895.

Any stock upon which this assessment shall remain unpaid in San Francisco, on the 20th day of April, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD JR., Secretary.

Office—Room 56, Nevada Block, San Francisco, California.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 20th day of March, 1895, an assessment (No. 18) of Ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 23d day of April, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

DELINQUENT SALE NOTICE.

BOOTH GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Auburn, Placer County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 5) levied on the Eighteenth day of February, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amt.
Richard Chenery, Trustee	160	6,275	$125 50
Richard Chenery	17	5	10
Thomas May, Trustee	148	500	10 00
Thomas H. Gordon, Trustee	68	1,000	20 00
Thomas H. Gordon, Trustee	112	100	2 00
Thomas H. Gordon, Trustee	114	100	2 00
Thomas H. Gordon, Trustee	116	100	2 00
Thomas H. Gordon, Trustee	117	100	2 00
Thomas H. Gordon, Trustee	118	100	2 00
Henry Gilman	38	300	6 00
Henry Gilman	175	1,000	20 00
E. S. Harrison, Trustee	177	1,000	20 00
J. W. Winter, Trustee	161	250	5 00

And in accordance with law, and an order of the Board of Directors, made on the Eighteenth day of February, 1895, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the salesroom of S. P. Middleton & Co., No. 30 Montgomery Street, San Francisco, California, on WEDNESDAY, the Seventeenth day of April, 1895, at the hour of Two o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

GEO. R. SPINNEY, Secretary.

Office—310 Pine Street, Room No. 28, San Francisco, California.

WANTED!

$2500—Wanted, a competent and honest quartz mill man, with above sum, to take half interest in custom quartz mill, permanent and desirable.

$5000—Wanted, a competent and honest quartz mill man (assayer preferred) to take interest in a custom quartz mill, chlorination works and a group of developed mines.

Both of these investments are safe and desirable, and invite investigation. For particulars, address

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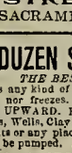

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Jas. Linforth, 37 Market St., San Francisco.

Coast Industrial Notes.

—According to the new directories San Francisco's present population approximates 375,000.

—The total subscriptions of stock in the San Francisco and San Joaquin Valley Railroad to date aggregate $2,500,000.

—The eight per cent bonds of the Nevada County Narrow Gauge Railroad Company have gone from par to $110 bid.

—The Goldeu State and Miners' Iron Works have u contract for a 400-H. P. Corliss engine tor the Mutual Electric Light Co.

—Miller & Lux are putting in a large refrigerating plant at Butchertown. It is being built hy the Cyclops Machine Works.

—The Francis Smith Co. have about finished their $150,000 contract for twenty-two miles of pipe for the water company at Oakland.

—Right of way to put down an electric road from Goleta through Santa Barbara to Carpinteria, via Montecito, has been granted.

—The largest steel beam ever made on the Pacific coast was put in place in the new Parrott block on Market street last Sunday.

—The work of putting up the poles which are to be used to hold the wires that are to transmit the electric power from Folsom to Sacramento is about completed.

—A Southern Pacific trust deed recorded at Bakersfield transfers all of the company's property, including rolling stock, to the Central Trust Company of New York for $58,000,000.

—The uew steamer just finished by the Fulton Engineering und Shipbuilding Works for the Baronoff Packing Co., of Alaska, has been accepted by the owners and goes into immediate service.

—The Atlantic and Pacific roundhouse and machine shops at Winslow, Arizona, were burned last Wednesday. Eight locomotives were destroyed. The company's officials estimate the loss at $100,000.

—The Chino sugar factory consumes 1000 tons of sugar beets daily, and turns out 135 tons refined sugar per day. The factory cost $1,100,000. An oil pipe line is now building to supply it with fuel from the Puente wells. Three 17,000-barrel tanks will he used, and fourteen miles of 3-inch pipe.

Receiver Bird of the Tacoma Railway and Motor Company reports for February: total receipts, $4075.16; disbursements, $3117.09; net profit, $958.47. The net profit in January was $792.55, and in December $471.75. The assets of the company he reports to be $2,409,994.16, and the liabilities $25,200, unpaid interest on bonds.

—China and Japan are beginning to use more flour. England took 400,000 barrels less in '94 than in '93; China took 33,000 barrels more; all Asia 67,000 more, an aggregate of 698,878 barrels having been imported into that region last year. Japan is building flouring mills, and this year will probably see coast wheat cargoes sent to China and Japan.

—The largest individual wine deal ever made in the State was closed this week, F. Chevalier & Co., of this city, buying at 12½ cents per gallon from Dowdell & Co., of St. Helena, 400,000 gallons dry wine now stored at St. Helena. The wine has already been sold to prominent wine dealers in New York, where California wines are commanding better prices each year.

—Thomas Taylor, of Utah, who claims to hold Government pateuts for immense coal and iron fields in southern Utah, is in San Diego in the interest of the plan to build u railroad from Salt Lake to the bay of San Diego. His project is to turn over the property, which he considers worth $5,000,000, for stock in the company that would build a railroad between Salt Lake and San Diego.

—A San Joaquin valley land-owner has offered to place 200,000 acres of fertile land at tbe disposal of the New Eagland Colony Association on terms of interest only, for ten years, provided all the land suitable for cultivation in small tracts should be taken and occupied within two years. The object is to bring to California the native element of the Atlantic seuboard, who have been displaced by European immigration.

—A San Jose fruit-packing company has bought American rights for a new German method of preserving fruit in glass jars, with covers kept on by exhaustion of air in the jar. No solder is needed, and in opening the jar all that is necessary is to puncture the covers. Many million dollars' worth of tin plate is imported every year for canning fruit, vegetables and fish, and if the new process is successful this money will be spent here for glass jars.

—The Krogh Manufacturing Co., of this city, have recently bought the entire manufacturing plant of the San Francisco Tool Co., occupying the extensive brick building on Stevenson street numbering 11 to 19. The firm will continue the manufacture of water works pumps, centrifugal pumps, land reclamation and dredging machinery, water gates, etc. The new establishment will be conducted separately, and in addition to the company's works on Beale street.

—The Sacramento city trustees are having a great time in placing an order for pumps and pumping engines. Some months ago it was decided to buy, and proposals were called for, which, upon receipt, were referred to "a committee of experts on pumps," who, in due time, reported, making recommendation that a contract be given the Edward P. Allis Company, of Milwaukee, Wisconsin, for a 5,000,000 gallon vertical triple-expansion pumping engine for $18,300. At last Monday's meeting a motion to adopt the report and so award the contract was beaten by a vote of 6 to 3. The clerk was then instructed to advertise for new proposals.

The Wilson

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NOTICE TO GOLD MINERS!

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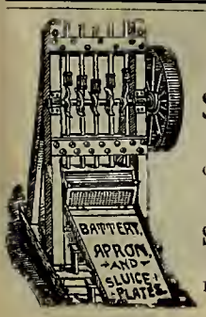

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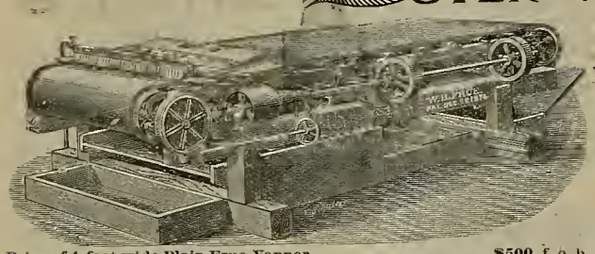

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; March 31, 1891.

—o—

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(Successor to ADAMS & CARTER,)
AGENT FOR THE
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" " "	Improved Belt Frne Vanner	600, f. o. b.
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GLADSTONE MINING COMPANY. FRENCH GULCH, Shasta Co., Cal.,
C. J. Clark, M. E., Gen'l. Supt. Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill. C. J. CLARK, Gen'l Supt.

IMPROVED CRAWFORD MILL.

The Cheapest and Best Mill for extracting gold from comparatively free milling ores. Requires one-third the water, and three-fourths the power of stamps. Costs less, is operated cheaper, and will save 20 to 40 per cent more gold. Average saving 85 per cent. Inexpensive foundation. No plates or screens. Wear and tear guaranteed not to exceed thirty cents per ton. Capacity ten tons. Full particulars,

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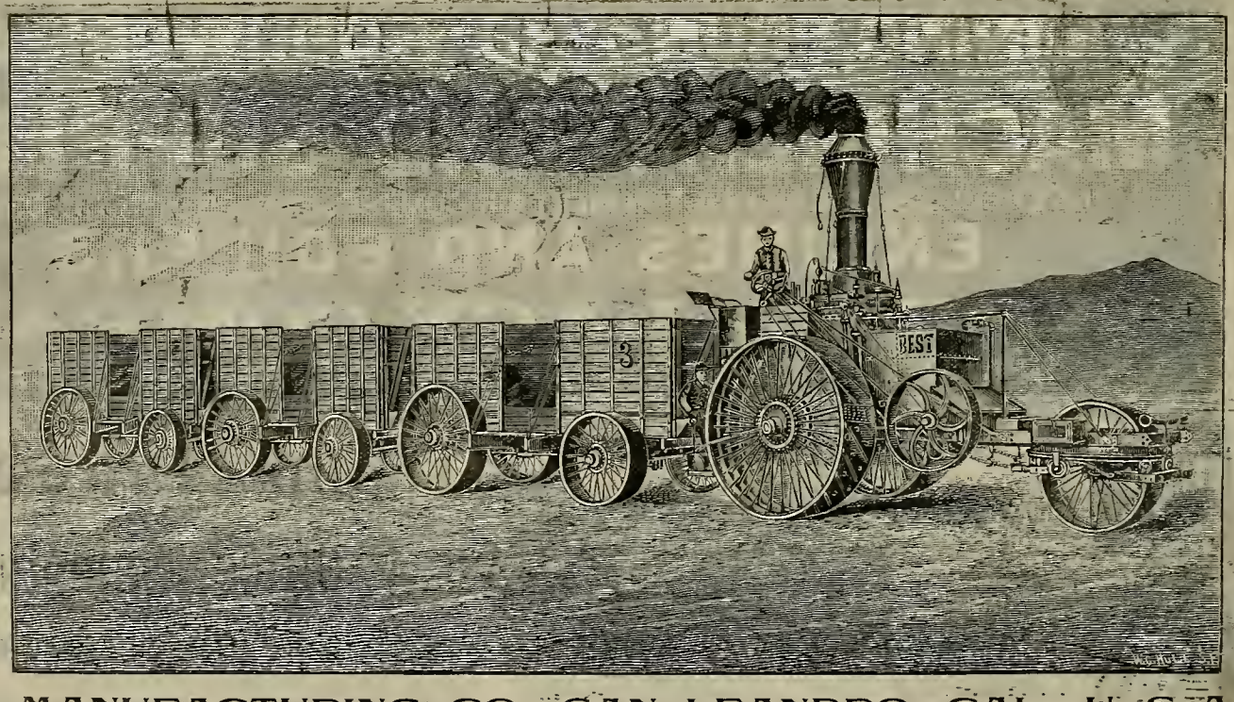

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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 16. SAN FRANCISCO, SATURDAY, APRIL 20, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Red Rock, Goler and Summit Mining Districts in Kern County.*

The districts above mentioned are a part of the Mojave desert, in the northeastern part of Kern county. Tbeir placer deposits lie along the foothills of the Sierra Nevadas, cut through in places by wasbes emptying southward. Mainly confined to the north side of this line of hills is a series of beds of conglomerate, sandstone, volcanic tufas and lava-flows, dipping away from the range at an angle of 20° to 25°. The conglomerates at the base are free from volcanic pebbles; consisting of many kinds of rock; some foreign to tbe district, cemented and followed upwards by friable sandrock and volcanic beds. This is evidently a deposit on a marginal sea or lake bottom which has been elevated from the south and tilted northward. This elevation is greatest on El Paso peak, where it is nearly 5500 feet. Jaw Bone, Red Rock and Goler canyons, with lesser tributary canyons emptying southward, have cut these beds to a great depth. It is in these canyons and on the hills bordering them that the most of the placer gold is found. At tbe Summit, the easternmost district, the sandstone covers up the underlying metamorphic bedrock, and in the shallow washes draining southward from this sandstone the gold is found.

These facts all point to an original sea beacb on which the gold was collected by various means, decay of rock strata, wash of streams, etc., and that afterwards an elevation took place, followed by erosion of the present gulcbes, in which the gold has concentrated from the old conglomerate and sandstone. Little evidence has yet been found to show the original source of the gold. In the vicinity of Red Rock the porphyry is much mineralized over large areas, but it is not known whether it carries gold. Perhaps the richest gulch on the north side of the ridge, whicb between Red Rock and Goler is known as El Paso, is the Bonanza, which lies about two miles east of Red Rock. Here, as in the other gulches, tbe gold is found in the wash from the basal conglomerates and lava tufas. It is found not only in the gulches, but on the slopes of the hills several hundred feet above, and in the wash from the sedimentary deposits rather than from the crystalline rocks. In fact, only traces of gold are found in those gulcbes which head on the south side of the range or which lie above the conglomerates and other sedimentary formations. West of Red Rock no nuggets have been found. But little float quartz is found in the gravels, although small particles are often found adhering to the gold. Hundreds of claims have been taken up in the region about Red Rock, though but few of them have been worked. Water is needed to make these camps very successful, for although a few of the gulches are very rich, many are not sufficiently so to pay for using a "dry washer." There are said to be hundreds of acres which it would pay to sluice if water in sufficient quantity could be obtained.

The next gulch east of Red Rock is the Last Chance, which heads in El Paso peak and opens southwesterly across the range. Gold is found sparingly distributed over much country along this gulcb, and is more difficult to obtain, owing to the great depth of tbe wash in many places. In places in this gulcb and its tributaries

(*Continued on page 245.*)

SANDSTONE CLIFFS NEAR RED ROCK, KERN COUNTY.

SUMMIT CAMP, TEN MILES EAST OF GOLER, KERN COUNTY.

BLACK MOUNTAIN, BETWEEN GOLER AND RED ROCK, KERN COUNTY.

STRATIFIED VOLCANIC TUFA, EAST OF RED ROCK, KERN COUNTY.

* Compiled from an article by H. W. Fairbanks, in Twelfth Report of State Mineralogist.

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Our latest forms go to press on Thursday evening.

J. P. HALLORAN.....General Manager

San Francisco, April 20, 1895.

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THE growing sentiment in favor of remonetization of silver shows that the Nation is at last realizing that it is not, as has been charged, a simple effort of silver producers to make a market for the product of their mines, but a prime necessity in national prosperity.

THE contemplated affiliation of the Technical Society of the Pacific Coast and the Mechanics' Institute will not take place. The latter institution was not averse to the idea provided the Society would merge itself into and be absorbed by that organization; but the desire of the Technical Society to preserve and maintain its separate autonomy made the idea inexpedient. The most cordial relations exist between the two organizations; and each will continue separate and independent as before.

FOUR WEEKS AGO extended notice was given the famous case of the Tyler vs. the Last Chance Mining Co., wherein the Secretary of the Interior had given a point in favor of the former on a side litigation, the main issue being at the time in the United States Supreme Court. That tribunal this week reversed the decision of the U. S. Circuit Court of Appeals, and remanded the case for a new trial. Had the Court decided in favor of the Tyler, it would have been final. The attorneys of the Last Chance think that this last decision in their favor is final, as the Court of Appeals, to which the case goes back, must decide in their favor, but the Tyler attorneys say the final result will depend upon the nature of the instructions sent back by the Supreme Court. So far, the Last Chance owners have spent $125,000 in litigation; the Tyler people nearly as much more, and the end is not yet.

EXTENDED REFERENCE was recently made in this column to the new London Sulman-Teed process for the extraction of gold by the agency of bromo-cyanogen, it being claimed by its inventors that oxygenation was unnecessary and that the accelerating effect of the bromo-cyanogen was such as to bring about in a few hours what required days by the ordinary cyanide process, and was also similarly claimed that the most rebellious of gold ores could be satisfactorily treated by this new process. Two companies have been formed in London, England—"Sulman's True Gold Recovery Syndicate," and "The Gold Ore Treatment Company," each with a large nominal capital. The former has been absorbed by the latter upon the payment of £5000 in the shape of 5000 £1 shares of hitherto unissued capital of The Gold Ore Treatment Co. The officials of this company claim that they have very good prospects for immediate success and that their stock is now worth £2 5s per share.

The Mint and Civil Service.

When the Civil Service law was passed, it was a great surprise to the people that the Mints of the United States were not made subject to its provisions. A word from Mr. Burchard, the Director, would have saved that great service from the evils of the party spoils system; but he has been excused on the ground that he was at that very time fighting to be continued as Mint Director, and had no time to bring this matter to the attention of Congress.

The Mint in San Francisco handles from thirty to fifty millions of dollars every year. The gold and silver bullion sent to that institution for coinage is in all sorts of crude conditions, and some of it is subjected to twenty or thirty operations before it comes out in standard coin. In these various operations hundreds of persons must handle it. Honesty, conscientiousness, large experience and technical knowledge are needed on the part of those who have to do with mint work, in its various processes of melting, assaying, refining, ingot making and coining. Why should the letter carrier be protected by Civil Service laws, while persons in the Mint have no protection?

Every Mint superintendent in San Francisco for the last twenty-five years has lived a burdened life, on account of the demands of Congressmen and political bosses. The real work of the superintendent has to be performed very largely by his chief clerk. Judge Lawton, H. L. Dodge and Mr. Burton had some independence; but they could not always do as they wished. Senators Sargent, Stanford and Felton were the powers behind the throne. They had but to say to the superintendent of this or that man in the Mint, "He must go," and he went. No matter how efficient or how long tried, he must go, and his place was filled by some politician who could do good service for the party, and for the Senator who had placed him in the Mint.

Each new superintendent, instead of familiarizing himself with the financial conduct of the Mint, studies the pay roll, consults his political backers, the local or interior bosses of the party, and then begins to wield his official axe. In the course of a year or two he has turned out all he can well discharge, and then begin his own troubles. Two or three thousand men and women asked to be appointed. Only one hundred or perhaps one hundred and fifty received appointments. For every lucky applicant there are fifty who fail to get in the service; and now they hate the superintendent. Under the spoils system he has done his best. But what a failure! What an army of enemies rises up to curse him up hill and down! Looking back, we can all remember how Gen. La Grange raised an army of political foes; how Henry L. Dodge had to withstand the assaults of a Congressman because there were not offices enough in the Mint for the friends of Mr. Page; and now the present superintendent—Mr. Daggett—is having the lash laid on his back. It seems that he had political ambitions, and they tell us that he used the Mint to forward his aspirations. Under the spoils system it would be strange if he did not try to favor himself a little while helping others. Gen. Dimond had an ambition also to be Governor, but Mint patronage buried him. The bosses could not get places enough, and so an army of disappointed ones are ready to down him. He suffered. Mr. Daggett is now the object of their hatred. It is as it has been and will be until service in the Mint shall depend upon honesty, efficiency and good conduct instead of political service.

Another vicious result of the spoils system in the Mint is its demoralizing influence on the men there employed. So long as they have the backing of some boss or Congressman, they feel secure, no matter how they deport themselves. The superintendent himself or the coiner or assayer cannot hold the man to the same rigid rule as others are held because he has a pull. Mint officers could give some information on this subject that emphasizes this statement.

The insecurity which one feels in the Mint service when a new superintendent starts the official guillotine unfits him for work. He becomes inefficient, and time that should be given to the Government is spent seeking to get some influence to prevent his removal.

The tyrranical power of the spoils system is wielded with telling effect just before a general election. In spite of the law which forbids political assessments to be made upon people in the Mint, the superintendent decides for each employe what he should give to run the campaign, and contrives to let it be known that if it is not paid he will be dismissed.

The superintendent does not assess openly, but for all practical purposes he might as well do so. The law is a dead letter. The poor man who works for $75 or $100 a month, and earns it, who needs it for his family, has no option. He is told that the committee has put him down $50 for the party expenses. He pays it, swears about and denounces it, but all the same he pays it in order to save his position. The tens of thousands raised in this way out of the Mint and other Government institutions, through the committees, is a big fund manipulated for the benefit of the bosses.

The San Francisco Mint has been used by the spoilsmen and bosses for a quarter of a century, as no other Mint in the country has been used, unless it be the Mint at Carson. Andrew Mason, a life-long Democrat, has had charge of the New York Assay Office for a third of a century, through all administrations. He has never allowed politics to run his office, and when the bosses have asked him to allow the employes there to be assessed he is said to have a waste-basket for all such letters.

The Civil Service law should be extended to the San Francisco Mint. It would promote efficiency, tend to economy, exalt the character of the service, and would be a boon to its superintendent. It would make him a superintendent in fact, be a welcome change to all the officers of that institution and a great benefit to the people.

THE Sacramento *Record-Union* has begun a new crusade against hydraulic mining and daily devotes considerable space to opposing the only present paying industry in the State. Our Sacramento contemporary argues that hydraulic mining is destructive to the State, demoralizing to those who so mine, immoral in its workings and tendencies, and a bad thing generally. These are matters of opinion, and, of course, the *Record-Union* has a right to be wrong. But it has no right to make statements that are untrue. It publishes editorially, and reiterates a great many things, in ignorance or defiance of the facts; it misquotes history, distorts statements, garbles records, and throughout evinces more of a desire to be false and malicious than fair or candid. Those utterances are in painful contrast to its usual dignified and courteous manner, and can only arouse a feeling of regret that a journal which has so often reproved reckless mendacity in others should descend to such low levels of journalism itself. The cause it champions must indeed be a weak one when it fails to cite argument or truth, and contents itself with utterances that are in direct opposition to the facts and apparently made only to foment prejudice and antagonize interests that are gradually and amicably uniting. As for answering the *Record-Union's* recent statements, they have long since been completely and effectually answered by the logic of events. It is hoped that its madness is but temporary. If it will drop direct falsehood and manifest exaggeration, and deal with this subject as a decent journal should, its adverse comments will receive attention and answer, which its present ravings neither deserve nor require.

NOT content with South African opportunities for investment in mining shares or snares, the eager Parisian public is at present embracing another golden opportunity. The auriferous black sands of New Zealand also engage favorable attention, and a Lieutenant Bassett tells his mercurial French friends that on a capital of £70,000 they will make an annual profit of £86,000 for ten years. The account naively says that "Monsieur Bassett has hit upon an ingenious idea of separating the iron sands from the gold by magnetic attraction." The hundreds who long ago hit upon the same idea here will view "Monsieur Bassett's" New Zealand progress with considerable interest.

Concentrates.

THE Bonanza mine near Baker City, Or., cleaned up $7,500 in gold in March.

STOCK shares in the DeLamar mine of Idaho are selling in London at 31 shillings.

THE Taylor mine, Placer county, is arranging to put in another 40 stamps, making 90 in all.

A RICH ledge of free gold is reported from the Ackerman mine, three miles from Auburn, Cal.

THE Poorman, at Boise, Idaho, has 180 men on its pay roll, the monthly disbursement is about $20,000.

THE annual meetings of the Goleta, Montecito and Sterling Mining companies have been called for May 8.

THE Rock Creek Mining Co. have put in a Hammond 10-stamp mill at their mine near Baker City, Or.

THERE are so many $20 gold pieces in Rossland, B. C., and so little change that silver coinage is at a premium.

SPOKANE, WASH., has a laudable desire to have sampling works and a Government assay office established there.

THE Spanish mine at Washington, Cal., is to be opened by Fred Bradley, who will have a new mill erected on the property.

HALF the able-bodied men in Douglas Co., Wash., are reported to be getting outfits ready to rush to the Methow mines.

THE Reward Gold Mining Company of Nevada county has levied an assessment of 2½ cents per share, delinquent May 10.

PRELIMINARY arrangements are reported for amalgamation of all the miners' unions in Colorado, Wyoming, Utah and New Mexico.

A NEW rate of $6 per ton on ore from Spokane to Everett, and $6.50 to Great Falls, Mont., has been put in effect by the Great Northern.

THE Idaho Springs, Col., *Gazette* says the recent reduction in the price of smelting around there means all the way from $4 to $10 per ton to the miner.

AS NEAR as can be ascertained, it is believed that there are now 17,000 men engaged in mining in the three States of California, Oregon and Washington.

THERE is talk again of the starting of a smelter in Prescott, Arizona. This has been talked of off and on for years, but the present talk sounds business-like.

RICHARD PHELAN, superintendent of the Gold Ridge mine, tells the Grass Valley *Union* that the company intends to erect a 40-stamp mill some time this summer.

A MICHIGAN Bluff, Cal., correspondent says that Chinamen are again employed at the Hidden Treasure mine at Sunny South—about 25 of them at $1.50 per day.

NEW hoisting works, etc., are to be bought by Supt. Nibel, for the Brunswick mine at Nevada City, the recent strike at the 800-foot level justifying the expenditure.

BAKER CITY, Or., men report that the Belleville mine will soon be sold to Eastern parties for $200,000. The full development of that mine would put 200 men to work.

AFTER paying $500,000 in assessments the Le Noria Silver Mining Company of Mexico with head office in Pittsburg, has passed into the hands of W. L. Munstin of that city.

UNDER a law passed by the Arizona legislature, a heavy penalty is attached to the "salting" of a mine for the purpose of deceiving any one as to the value of the ore it contains.

J. WHITE of Baker City, Or., has a contract for constructing a water ditch from Jordan creek to the Chicago Company's placer mines on Burnt river, a distance of two and a quarter miles.

OREGON prospectors report a good gold country between Burat river and the bend of Snake river, about twelve miles north of Huntington, and say that free-milling gold ledges are plenty.

A DISPATCH from Weaverville, Trinity Co., states that a wagonload of Japanese laborers, going to Big Bar to work near there, were stopped at Junction City by miners and sent back.

A COLUSA COUNTY MAN writes to the *Examiner* for information as to where he can get a needle "used by miners for the discovery of gold." A haystack would be a suitable place for him to look.

THIRTEEN Comstock miners leave here on the 24th for the Candelaria mine, San Demis, Durango, Mexico, in the employ of S. Treglone who has a $30,000 contract to run a 2,500 foot tunnel there.

THE *Sentinel* says for the month ending March 31st, more than $1,000,000 pounds of sulphurets were loaded at Colfax, consigned to the Selby Smelting Works in this city and to Everett, Washington.

STOCKS were quoted in San Francisco, June 15, 1866, as follows: Chollar-Potosi $200, Imperial $112.50, Gould & Curry $750, Hale & Norcross $960, Savage $1010, Belcher $195, Yellow Jacket $695, Ophir $345.

THE Carson River Placer Mining Company that works the dredge near Dayton, Nev., recently illustrated herein, started up its plant last week. About twenty men are employed, and it is said that the results are highly encouraging.

THE County Clerk of Coos county, Or., says the *Coast Mail*, received a United States patent to record, last week, conveying 125,409, 45-100 acres of land in that county to the Oregon and California railroad company.

THE four-stamp quartz mill of John Sipp & Co., near Blue Canyon, Cal. has been crushing ore all winter. They are working what is familiarly known as the old Red Stone quartz ledge, and will soon put on more men.

THE Orr Extension Ditch Company of Reno, Nev., has levied an assessment of $15; delinquent May 26. The North Banner Consolidated Tunnel Mining Company of Nevada County has levied one of 3 cents, delinquent May 14.

LAND COMMISSIONER LAMOREAUX has issued instructions to the mineral land surveyors in Montana and Idaho, recently appointed by the President, to organize by the 25th of this month and be ready for business by May 1st.

MINING reports from about Yale, B. C., show considerable activity there. Yale bar, across the Yale, is being worked by a company with plenty of capital. Preparations are making to work the Siwash creek mines. At the mouth of the canyon white men are rocking out from $3 to $10 per day.

A CONFERENCE of Tasmanian miners has resolved that every prospector should have a life interest of 1 per cent of the net returns of minerals won from any mine or mines he may have discovered, such interest not to be transferable.

THERE has been no change in the law relative to the regulation $100 worth of labor for improvement on mining claims. So claim holders have till December 31st, 1895, inclusive, to do their assessment work for the current year.

IT is said on good authority that a party of French capitalists have gone to Quesnelle river to look at mining claims owned by the Seattle company, says the Victoria *Colonist*. If the mines are as represented a transfer will take place.

DR. LANGHAMMER is investigating the prospects of the St. Helens mining district in Lewis county, Wash. He represents Pabst, the millionaire brewer of Milwaukee, and other eastern capitalists, who have options on properties in that district.

THE old pump at the 900 level of the Providence, Nevada Co., mine has broken down and will have to be replaced with a new one. In consequence of the break-down and the necessity of changing the pump, some of the miners have been laid off temporarily.

SUPERINTENDENT PARKS, of the Kennedy mine, says that the account in an Amador paper last week of a half ton of rock from the Kennedy going $130,000, is a no such thing. While the Kennedy has rich ore they are not "refining it at the chlorination works."

THE annual gold boom has struck the Copalis, Wash., beach. Ten tons of sand were shipped here recently, and if that amount of sand turns out as much mineral in proportion as one ton did that was shipped here some time ago, 20 or 30 machines will be shipped up immediately.

FIFTY men are at present working in the West Harmony drift gravel mine, Nevada Co. The fifteen-stamp mill runs steadily seven days a week. Superintendent Gassaway considers that by careful mauagement gravel going eighty-five cents to the car can be made pay.

THE Denver commissioners have voted $100,000 in aid of the mining and industrial exposition to be given there. The city will appropriate $75,000 or $100,000, and Congress will be asked to appropriate $250,000. Eighty acres in and around the city park have been chosen as a site for the exposition.

AT the annual meeting of the Champion Mining Company the following officers and board of directors were elected: Gus Kartschoke, president; H. Mohr, vice-president; J. S. Ott, J. Moock, J. Assion, Joseph S. Schuster, Dr. A. Wilhelm, Frederick Zeitler, superintendents; J. F. Holling, secretary.

AN item is traveling around to the effect that the United Verde, Jerome, Arizona, "produces annually 1,500,000 ounces of gold, 7,000,000 ounces of silver, 9,000,000 pounds of copper." The copper proposition is all right, but the other figures would be nearer the truth were the three right hand ciphers dropped.

AT Gem, Idaho, the Frisco mine is running with about 100 men, sinking and crosscutting fine ore. At the 200-foot level a 70-foot vein of galena ore was uncovered. The Gem is now sinking, doing considerable development work, and making repairs. They expect to begin active operations shortly with a full force of men.

ADVICES from Osborn, Idaho, are to the effect that trouble is feared between the miners' union of the Cœur d'Alenes and the manager of the Bunker Hill and Sullivan mines, "should he decide to start up the mines or even openly offer to do so on the company's proposed scale of $3 per day for miners and $2.50 for shovelers."

A LONDON cablegram says the appeal of the Cassel Gold-Extracting Company of Glasgow from a decision of the lower court against the validity of its patent for the cyanide process of treating refractory ores has been dismissed, but that, by an amendment of the specifications of the patent, the defect held by the Court to exist can be cured.

THE Marlow Mining and Development Company has incorporated at Sacramento, "to do general mining and to buy and sell water for mining purposes in Tuolumne county." Capital stock, $300,000. Directors—J. Graham, Forest Home; F. J. Cross, Tuttletown; C. E. Weinrich, A. P. Seheld, T. L. Enright, W. W. Andersen and G. D. Stewart, Sacramento.

TWO EXPERIENCED MINERS went to the old Manzanita mine, near Nevada City, on Tuesday with pans and pushed over a large boulder, beneath which was a small quantity of gravel. The first panful of dirt yielded $40; the second, $50; while they secured $8 from the tailings. The *Tidings* says they would like to find some more boulders waiting to be pushed over.

COLORADO papers say that smelters are preparing for a great increase in the visible supply of silver, which has been exceedingly scarce for a year or more. They have agents in all the mountain towns, and they report that miners of silver are returning to their properties that were shut down after the slump, and are preparing to take advantage of the present advance.

THE Deadwood *Pioneer* says the Holy Terror deal has been consummated on the following terms: The Chicago parties deposit $25,000, sink the shaft 300 feet on the ledge, and also deposit the amount of gold taken out while sinking. If, when the shaft has reached a depth of 300 they decide to buy the mine, they pay the owners $125,000. If not, they forfeit the $25,000 deposit and all the mineral taken out while sinking.

OF Cripple Creek, Colorado, *Ores and Metals* says: A mining man who paid $9.75 a ton for treating his ore in Denver in combine days, now pays $5. The stamp mill ore treated in the district averages $10 per ton caught on the plates and concentrates and that treated by chlorination averages $30. It is intimated that the reduction works, recently completed at Florence, are not suitable for the treatment of Cripple Creek ores.

WHEN Col. F. R. Morton was killed at the Cananeas property in Sonora, Mexico, he left some money in the bank at Nogales, Arizona, which has been administered upon. E. Self, assayer there with Col. Morton, will push work on the mine. The terms of the sale of the property are understood to be $50,000 in two months, with development to be done in the meantime to the extent of $300 per month. The property belongs to Mrs. Pesquera. About $20,000 has already been paid on the property. The buyers are the Heinz Brothers of New York, heavy copper owners in Montana. The property was abandoned at the time of the killing of a superintendent twelve years ago.

THE Nevada Silver Mining Company, with headquarters in Chicago, and mines in Tem Pahute, have issued bonds on the property to the amount of $1,050,000 in five series, bearing interest. The bonds are in amounts from $500 and upwards. The property consists of a group of seven silver mines, and are generally regarded valuable. This system is a new departure in the manipulation of mining, and its results are looked forward to with considerable interest.

THE official returns of the ore worked and the bullion produced at the Nevada mill for the Chollar Mining Company for March shows that 820 tons were worked, yielding bullion of the gross assay value of $19,661 28. The cost of reduction was $4,920. The net proceeds in bullion were valued at $12,-277 14. The average assay of the ore per ton was $27 76. The gross average per ton was $23 98. The net average was $17 98 per ton. The mill worked the ore up to 89.2 per cent. of its assay value.

THE following is from last Wednesday's Sacramento *Bee*: "The Executive Committee of the State Anti-Debris Association met in this city yesterday afternoon. It was reported that Heustler's dam, near Columbia Hill, Nevada county, had broken, and that quantities of debris were passing through the break and down the river channels. The break is forty feet wide. The North Bloomfield dam, it was reported, had also broken, with the same result, the debris which it had been holding back now passing down into the Yuba river."

THE Madera, Cal., *Mercury* says: Tax Collector L. W. Krohn brought with him from Coarse Gold about $600 worth of gold dust. He stated that the gold was brought to his store by squaws and given to him in exchange for provisions and clothing. The gold was found in the gullies about Coarse Gold. This is the only kind of currency the Indians possess. Whenever the Indians want some food or clothes they go out into a gulley and scrape up a little gold which has been washed down by the streams or by the rains. Mr. Krohn says that the statement that gold can be picked up about Coarse Gold is literally true.

REGARDING the Comstock, last Wednesday's Virginia *Enterprise* says: "The situation in the Con. Virginia, which was fully described in the last letter of Superintendent Lyman, is creating much enthusiasm in mining circles. So far as known the new ore body which is being followed and which is apparently improving as progress is made on it, is not interfered with by any old workings. There is now enough ore in sight to warrant starting the mill soon, and the proceeds from the new body will reach a very respectable figure. There is little news to be obtained from the other mines on the lode."

DIRECTOR OF THE MINT PRESTON has received a report from Andrew Mason, Inspector of the United States Mints, stating that the actual gold shortage in the Carson Mint is $75,499 72. No further shortage is expected to be found, as the amount stated is the result of nearly two months' careful investigation. John F. Jones, the assistant melter and refiner, who is under arrest in connection with the shortage, was suspended from duty April 6th and will be dismissed from the service. Other arrests are expected to follow. The bond of the melter and refiner is $20,000 and of the assistant $10,000. It is probable the Carson Mint will be closed permanently.

W. BROWN, manager and principal owner of the Volcanic Mountain claim, on the north fork of Kettle river, Montana, says the tunnel which is being driven by himself and assistants to tap the vein on the claim is now in a distance of 300 feet. If they are successful in striking a large body of ore their reward will be represented, not by hundreds of dollars, but by hundreds of thousands, as Mr. Brown considers that the day they strike the ledge with the tunnel this same claim will be worth to them a million dollars. This mode of developing their property is certainly a departure from the general methods adopted by the average run of prospectors.

—They do things in Australia that seem queer from a California standpoint. The following is from the *Australian Mining Standard*: "Mr. John Freeman, a mining manager at Wandiligong, has had a decidedly unpleasant experience of the power of law costs. Having spent two years in experimenting with the cyanide process of gold extraction, Mr. Freeman was summoned to tell the South African Commission, now sitting in Melbourne, what he knew of the matter. Mr. Freeman was willing to do this on payment of £150; and, as he stated himself, the information "was cheap at the price." The Commission, however, took another view, refused to pay the money, and applied to the court to compel Mr. Freeman to unbosom his cyanide secrets. Mr. Justice Hodges ordered Mr. Freeman to gaol if he persisted in his refusal to give evidence, and directed him to pay the cost of the proceedings. The judge takes the view that even if his research cost Mr. Freeman time and money, he is bound to give the administration of justice the benefit of it."

Personal.

PROF. POTTER of the Washington University, president of the Mining Engineers' Association and president of the St. Louis Smelting Company, is examining mining property in Inyo county.

W. W. WAGGONER has accepted the position of assistant engineer for the California Debris Commission vice W. B. Storey, Jr., resigned.

H. A. WOODS, of the Woods Investment Co., who has been in Lower Cal. for some weeks, has gone to Seattle, Wash.

Obituary.

J. W. HOWELL, foreman of the Copper Queen Con. mine at Bisbee, Arizona, died last week.

PROF. JAMES DWIGHT DANA, author and scientist, of Yale University, died at New Haven, Conn., last Sunday, in the 82nd year of his age. In 1837 he published "A System of Mineralogy," a work of high repute. He accompanied Lieut. Wilke's exploring expedition in 1838-42. During succeeding years he wrote a number of works on geology, mineralogy and kindred subjects. For many years he published the *American Journal of Science and Art*. He was a member of many learned societies in this country and in Europe.

Characteristic Features of California Gold-Quartz Veins.

NUMBER III.—CONCLUDED.

Read before the Geological Society of America by WALDEMAR LINDGREN, December 29, 1894.

Along the mother lode the altered serpentine has been variously interpreted. Whitney inclined to the belief that the vein represented a stratum of silicified dolomite, a theory that has not been supported by more detailed investigation. Fairbanks, who some years ago carefully examined the mother lode, considered it at first as vein matter deposited in open fissures, but regarded it subsequently (as the needed, once open space would manifestly have been too large, in places several hundred feet) as an altered, coarsely crystalline basic rock. The latter theory, while nearer the truth, is unnecessary. A careful investigation will not fail to disclose the fact that the mixture of carbonates and mariposite is nothing but an altered serpentine, and abundant transitions may be found to prove this. A locality showing this plainly is the App mine at Quartz mountain, Tuolumne county. This conversion is not astonishing when the facility is considered with which the serpentine is decomposed by carbonated waters into magnesite and chalcedonic quartz. Experiments by C. Doelter show that while at ordinary temperature and pressure water containing carbon-dioxide will, with simultaneous decomposition and formation of carbonates, dissolve 0.3 per cent orthoclase and 0.5 per cent oligoclase, serpentine will be dissolved at the rate of 1.24 per cent.

The large bodies of decomposed rock previously referred to as containing impregnations of auriferous pyrites and rarely free gold are in many respects interesting. In the ferruginous outcrops the iron pyrites is usually converted into ferric hydroxide and the gold set free; the whole mass can then sometimes be profitably mined and milled, though it is of very low grade. Veins and seams of quartz are often entirely absent in these impregnated zones. In the cases which have come under my observation the action on the rock is much the same as in the decomposed wall-rocks of the veins—that is, there is an abundance of carbonates and iron pyrites in sharp edged, little crystals. While there is abundant evidence of replacement by carbonates, I have not yet seen anything proving a replacement by quartz, though the possibility of such a process cannot be denied. However, in these deposits the action of the solution on the rock-forming minerals must have produced much free silica in solution and probably also much sodic silicate; in fact, there are in these deposits occasional masses of singular, grayish quartz very different from the ordinary vein quartz and probably partly chalcedonic. This quartz often contains iron pyrites in small scattered crystals, and appears to represent in part residual masses from leaching, in part deposition from supersaturated silicious waters. H. W. Fairbanks has recently described two deposits in El Dorado county, the Big Canyon and the Shaw mines, as showing in marked degree the replacement of the rocks by silica. Though the latter mine was not worked during my examination of the Placerville sheet. I have, through the kindness of Mr. H. W. Turner, had occasion to examine an excellent suite of specimens, lately collected. The vein is partly in black slate, partly in a feldspathic dike. Both rocks contain an abundance of stringers and seams of quartz and calcite, but I fail to see any evidence of the wall-rock by the former mineral. On the contrary, the porphyritic dike is to a very marked degree converted into carbonates in the vicinity of the veins. Regarding the Big Canyon mine, I have seen only two specimens of greenstone impregnated by pyrite from this mine, and collected by Mr. H. W. Turner. These specimens show carbonization to a considerable extent, but no evidence of replacement by silica. It is not intended to deny that such a process may take place, but only to point out that it is something requiring more and more detailed investigation. Calcite is found pseudomorphic after an enormously large number of minerals, while pseudomorphs of quartz after other minerals are much less common.

The country rock altered to carbonates, standing in strong contrast to the vein filled nearly exclusively by quartz, affords a much-needed key to the genetic processes of the deposits. It shows, first, that besides silica, the water circulating in the fissures contained large amounts of carbon-dioxide, as well as dissolved calcic carbonate. It certainly contained sodium as carbonate taken up from the feldspars of the adjoining rocks, probably also as silicate and chloride. It further contained sulphur, in what form is not certain, but most probably as sulphuretted hydrogen or as sulpho-salts. The presence of large quantities of sulphates does not appear probable.

Waters of this composition, containing abundant carbon-dioxide, are only known in nature as ascending, usually hot springs. The process of deposition took place as follows:

At first the carbonated waters began to act with great energy on the soluble minerals in the wall-rocks of the fissures, converting them more or less completely into a mixture of carbonates, potassium-micas and pyrites, adding calcium-carbonate and sulphur, probably also potassium, to them, and abstracting sodium. Finally, this process being completed, and the walls usually coated with crystals of carbonates, the formation of the latter ceased, and in this surrounding of carbonates the silica now began to be deposited, and with it the gold and the rest of the metallic sulphides.

A most interesting question in connection with this subject is, why the walls should, to such a large extent, act as a separating barrier for the gold and most of the sulphides. Mr. G. F. Becker, in discussing the quicksilver deposits of the Pacific coast, has suggested that this may be due to an osmotic action, transmitting through the septum only the chemically active solutions.

Admitting that the gold-quartz veins were deposited by such mineral waters, the next question is, in what form the gold and other metals were in solution. While not intending to enter into a detailed discussion of the difficult problems associated with the question, I would like to call attention to a few general facts connected with them. Gold is soluble at 200° Centigrade in a 10 per cent solution of carbonate of sodium to the extent of 1.33 per cent (Doelter), while silver is hardly attacked. Silicates of alkalies dissolve gold at 250° Centigrade to the smaller extent of 0.101 (Doelter and Liversidge). Besides, gold is more or less soluble in a great many other salts (T. Egleston). G. F. Becker has shown the solubility of gold in alkaline sulphides, and the solubility of the sulphides of Hg, Fe, Cu and Zn in either sodic sulphide, sodic sulph-hydrate or sodic carbonate, partly saturated with sulphuretted hydrogen. Silicate of gold, the existence of which was first suggested by G. Bischof, has been frequently mentioned as probably contained in mineral waters; but it should be borne in mind that the existence of this salt has never been proved. It appears that the mentioned facts are sufficient to show that the mineral waters, once circulating in the quartz veins of California, may easily have held gold in solution. It seems of questionable use to speculate on the particular combination in which the gold is contained in the water, for, according to the views of modern chemistry, watery solutions, when sufficiently diluted, contain the solids in a state of disassociation, so that it is uncertain whether salts of gold could exist as such in the always much diluted natural solutions.

The precipitation of the solids contained in the solution could have been brought about by many means, such as diminution of pressure, dilution, etcetera. The reducing influence of carbonaceous slates, so often maintained as the probable cause of the precipitation of the gold, appears of questionable importance. Veins entirely in massive rocks and far away from any sedimentary areas show too much similarity with those in such areas to attribute a paramount weight to this argument.

There are certain interesting analogies between the gold-quartz veins of the Sierra Nevada and the quicksilver deposits of the Coast ranges. In the Sierra Nevada the association of minerals is native gold with predominating quartzose gangue; carbonates in the wall-rocks, next in importance, iron pyrites with smaller quantities of the minerals of copper, lead, zinc, arsenic, and antimony; quicksilver ores are occasionally present. In the Coast ranges we have quicksilver in predominating quartzose, and to some extent carbonate gangue; next in importance, iron pyrites with smaller quantities of copper, antimony, arsenic, and nickel; gold is very commonly present.

Regarding the rocks adjoining the deposits, Mr. Becker says they "have in many cases been greatly modified. Metamorphic rocks often appear to have been converted into or replaced by more or less dolomitic carbonates by the action of solutions. * * Both serpentine and the metamorphic rocks seem to be subject to this conversion."

Containing a similar association of metals, similar gangue and similar altered country rock, it seems justifiable to express the conviction that similar mineral solutions have circulated in both classes of deposits; and, in fact, the still abundant thermal waters found in intimate connection with the ore deposits in the quicksilver region closely correspond in character to the inferred composition of the once existing hot springs of the gold belt. They all show free carbonic acid, as well as abundant carbonates (sodic, calcic and magnesic); silica is always present; usually also sulphuretted hydrogen or alkaline sulphides.

Carbonatization of the wall-rocks of fissure veins has neither been described by A. v. Groddeck nor F. v. Sandberger in their researches, though the former has found abundant sericite in many. The wall-rocks of the Comstock lode, according to Mr. Becker, are rich in iron pyrites, but do not contain much carbonates. J. H. L. Vogt has shown that along certain veins of Norway the granite and gneiss are altered to products resembling the "greisen" of the tin deposits.

Regarding the origin of the hot, auriferous solutions which have produced the gold-quartz veins it is best, at this stage of our knowledge, to speak with great reserve. Even the results of assays or analyses of country rock must be received with the greatest caution, to make sure that the percentage discovered is primary constituent and not later impregnation. It is not to be denied that many reasons speak strongly against a derivation from the surrounding rocks. Thus, for instance, the diorites of Nevada City and Grass Valley contain an appreciable amount of barium, and still there is no trace of barite in the veins of these localities. In another instance the diabasic rocks of the same region contain copper, and yet the gold veins passing through these rocks are remarkably poor in copper minerals.

In discussing this difficult question there are several broad facts which must be borne in mind:

First, that the gold-quartz veins throughout the State of California are closely connected in extent with the above-described metamorphic series, and that the large granite areas are almost wholly void of veins, though fissures and fractures are not absent from them.

Second, that in the metamorphic series the gold-quartz veins occur in almost any kind of rock, and that if the country rock exerts an influence on the contents of the veins, it is, at best, very slight.

Third, that the principal contact of the metamorphic series and the granitic rocks is in no particular way distinguished by rich or frequent deposits.

It is further apparent that gold deposits have been formed at different periods, though by far most abundantly in later Mesozoic times. Some of these later veins may have been locally enriched by passing through earlier impregnations in schist or old concentrations in the sandstones and conglomerates of the metamorphic series, the gold contents of which have, however, only been proved in isolated cases.

These considerations, though involving many most difficult questions, strengthen the belief that the origin of gold must be sought below the rocks which now make up the surface of the Sierra Nevada, possibly in granitic masses underlying the metamorphic series.

Summary. — The auriferous deposits extend through the State of California from north to south in an irregular broken line.

The gold-quartz veins occur predominately in the metamorphic series, while the large granitic areas are nearly barren. The contact of the two formations is not distinguished by rich or frequent deposits.

The gold-quartz veins are fissure veins, largely filled by silica along open spaces, and may dip or strike in any direction.

The gangue is quartz, with a smaller amount of calcite; the ores are native gold and small amounts of metallic sulphides. Adjoining the veins the wall-rock is usually altered to carbonates and potassium-micas by metasomatic processes.

The veins are independent of the character of the country rock, and have been filled by ascending thermal waters, charged with silica, carbonates and carbon-dioxide.

Most of the veins have been formed subsequent to the regional metamorphism which affected the auriferous slates and the older igneous rocks associated with them, and also subsequent to the granitic intrusions which closed the Mesozoic igneous activity in the Sierra Nevada.

Very Pure Gold.

To-day, says the Grass Valley, Cal., *Tidings* of the 10th, we were shown a certificate from the United States mint at San Francisco, dated December 8th, 1887, and it was the return of 6.32 ounces of gold dug from the ground near Rough and Ready. The gold sent was in amalgamated cakes and the above was the weight of the cakes before melting; after melting 6.09 ounces, the fineness thereof was 992¼, the sum being $124.91. The report shows that there was an entire absence of silver in the gold, a circumstance which we have never heard of before. It has always been the supposition that no gold was ever found without it contained a percentage of silver.

It will be seen that this gold was worth $20.51 per ounce, while absolutely pure gold is worth $20.67 per ounce. We believe that Rough and Ready can go on record as the producer of the purest gold dug from the ground. The mineral was taken out by Messrs. Hanley & Gross, who were partners at that time.

FEW realize how much good money the tramps cost this country. Accurate estimates of the number of these nomads are difficult to obtain. They are a variable quantity, but the number is formidable. In a lecture delivered in Boston recently by Prof. J. J. McCook, and reported in the Philadelphia *Ledger*, it was stated that there are about 46,000 male tramps wandering about in different parts of the country, eleven-twelfths of them being in the prime of life—that is, under fifty years of age. These men, the most of whom were able bodied, half of them having trades and nearly all of them able to read and write, cost the country, according to conservative opinion, from $8,000,000 to $10,000,000 annually. This is nearly half the cost of the navy.

The Prohibitive Seal Zone.

Written by PROF. GEO. DAVIDSON

On the 4th inst. the Geographical Society of the Pacific heard a paper read by Lieut. Commander F. J. Drake, U. S. N., commanding U. S. steamer Albatross, on "Recent Developments in Bering Sea." The lecturer stated, from his own observations, several facts about the fur seal, showing that the prohibitive zone of sixty miles radius, round the rookeries, is useless to protect the female seals in the breeding season. Outside of this connected double circle around St. Paul and St. George islands the decision of the Arbitration Commission permits the taking of seals by arrow and spear in a partial annular or zone about sixty miles wide extending from the east round by the south to the west northwest. The wonder has been why this outer partial zone was accepted by the contestants, but from Capt. Drake's developments we can readily conjecture. He has found that a branch of the Kuro Siwa, a warm stream of Japan, pushes across the middle of the Aleutian chain toward the Pribolof islands, St. Paul and St. George, through the two-thousand-fathom "deep," and carries with it the food fishes of the Aleutian islands. When this warm water, with a temperature of 42° Fahr., reaches the abrupt 100-fathom plateau of the Pribolof group it is met by the cold waters from the northeast part of Bering sea, which are mostly from the great rivers and is underrun by them. At the point of conflict the fishes of the warmer waters will not enter the cold-water area. There is a general absence of warm-water food fishes around the Pribolofs, and the female seals leaving their stations go to sea for food. They pass through the cold-water areas at a rate of twenty miles an hour and enter the warmer waters for food. Here the contents of their stomachs show the pelagic fishes that have come up from the Aleutians. This outer partial zone on the northern edge of the two-thousand-fathom deep is therefore their feeding ground during the season for supporting and feeding their young.

Now, it is a matter that can be sustained by proof that the Canadian pelagic fishers knew of this feeding ground, although they did not know the causes for the food supply. The Canadian Commissioners learned this, and communicated it to the authorities on their side, who kept very reticent in the matter, and made their terms of arbitration accordingly. The American Commissioners knew nothing of those very important facts and swallowed the pretty hook of holding sacred the inner sixty-mile zones, where relatively no seal food is found. As usual in arbitration, we got the string and the Canadians the pudding.

Last year the sealers reported 30,000 seals taken, nearly all females. For each female destroyed one young one died on the islands, and one embryonic seal was killed. Thus Capt. Drake estimates that 66,000 seals were destroyed last season. He has reported that at this rate of pelagic sealing it is but a few years when the whole herd will be reduced to a very few unless some cessation for one or more seasons be granted by the Governments. At present not only is the destruction great by the means allowed, but it is certain that some vessels use firearms, in which case they do not get more than one seal of every five that are shot, and it is within a reasonable estimate that last year's sealing cost the herd 100,000 seals, of which two-thirds were probably females.

Arizona Prospectors.

Arizona has few of the old-time prospectors left. Those who used to tramp over the hills with their burros in front of them have, like the antelope and buffalo, vanished and gone from sight. The prospector of to-day rides a bicycle forty miles and back, sleeps between sheets and takes a bath before going to bed.

Where an old timer would have spent six weeks in digging and picking from hill to hill, now a half an hour's gaze toward the horizon will convince the average prospector that some fellow has taken up the whole country, and he returns home, puts on his dressing gown and lighting his Havana, tells his wife that he has been prospecting and that there is "nothing in the new district which has not been taken up." The next day some more energetic person comes in with some rich rock, and the stampede is repeated over again.

What Arizona most needs at the preseut time is indefatigible prospectors who do not go crazy over a speck of gold, and who do not prospect with field glasses.—Prospector.

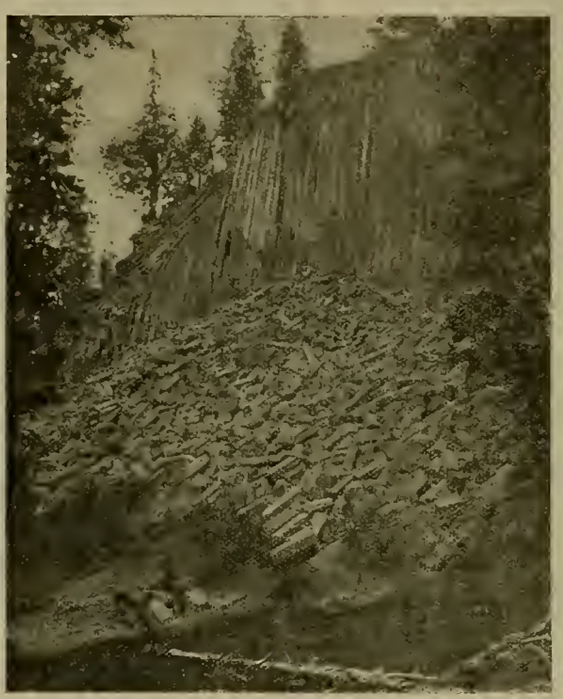
THE distance which derelicts traverse is much greater than is generally supposed. A careful record of observations has resulted in the preparation of a chart which shows that the hulk of the schooner Fannie E. Wolston has drifted, during the last five years, more than 10,000 miles. This calculation is based on forty-six reports of its having been sighted. Another derelict, which began its wanderings in 1891, drifted about 3500 miles up to the time it was last seen, when it had been afloat 615 days.

Red Rock, Goler and Summit Mining Districts in Kern County.

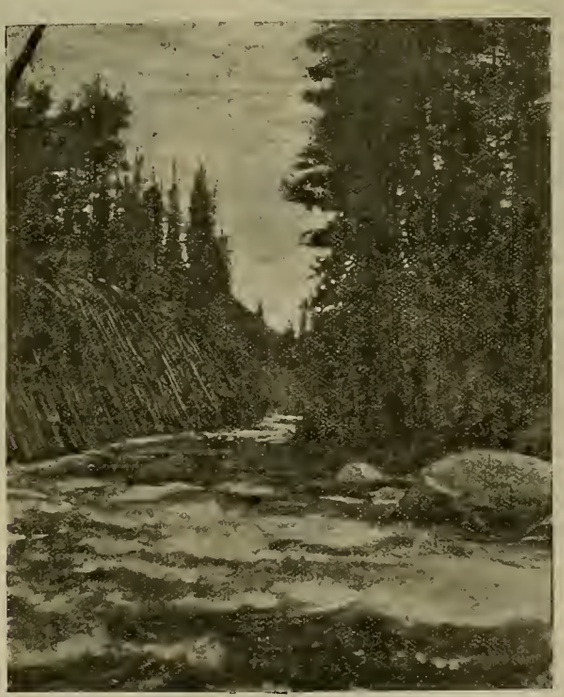
(Concluded from page 241.)

the gold is found on a sandstone bedrock, and in others in different layers in the gravels. Claims have been located for several miles, but owing to the scarcity of water but little is being done.

The Goler camps are situated at a depression of the range where a big canyon cuts through it, draining the sedimentary formations farther north. The Benson and Reed gulches, which were first discovered and in which big nuggets have been found, empty into the big canyon at its junction with the desert plains. These gulches are filled with volcanic and other bowlders, but do not head across the range. In Reed gulch a $1000 nugget was found. Just north of these rich gulches there are others much deeper and which empty into the big canyon. In these the bedrock outcrops in places; in others on the very irregular surface of the bedrock there is a thickness of nearly 100 feet of a cemented bowlder conglomerate, many of the granite bowlders being four to six feet in diameter. In the latter gulches the pay is also fairly good. The gold appears to be present as a concentration from the conglomerate.



COLUMNAR BASALT, NEAR HEAD OF KERN RIVER, CAL.



BASALTIC COLUMNS ON KERN RIVER, CAL.

At the Upper Goler camp, two miles above the lower, mining is also carried on along the slope of the mountains on which the sedimentary formations rest. Many shafts have been sunk in Benson gulch and in the others adjoining. In the former gulch the gold is the coarsest, there being many $10 to $50 nuggets. No quartz veins are found in the porphyry and slate in the vicinity of these gulches, and the source of the gold is quite problematical. The presence of the gold distributed sparingly in the conglomerates and more abundant in the gulches cutting them would indicate its derivation from the conglomerate. Strong currents must have been necessary to transport the huge granite bowlders so abundant at this point, but there are no definite traces of a river channel.

Summit camp lies eight miles east of Goler. At the former point the sandstone caps the ridge (the eastern prolongation of the El Paso range) and is in turn nearly hidden by the more recent wash. The shallow gulches which head in this ridge generally carry gold, though not always in workable quantities. It is said that prospects of gold can be found over much of the surface. This is the highest of the camps, having an elevation of 3300 feet. Water has to be hauled many miles. Although hundreds of claims have been located, only a few are being worked, and those not always successfully.

The same formation appears in places for some miles east of the Summit camp, but not much gold has been found.

Dry washers are used exclusively in these districts, but there are comparatively few places where the gold is abundant enough to make that method pay. If water can be introduced, there is without doubt a great future for the districts.

Fares and Prices at Cariboo.

A newly arrived Nevada county miner writes from Quesnelle Fork, Cariboo, B. C., under date of March 29, '95, to the Grass Valley *Telegraph* as follows:

From Grass Valley to Vancouver City, B. C., first-class fare with board included, is $30; from Vancouver to Ashcroft, our nearest railroad station, is $10.50; the stage fare from Ashcroft to here, a distance of over 200 miles, is $28.50, and their schedule time for the trip is four days, which an intending traveler must allow at the rate of $2 per day for living necessities. Many of the miners already here have walked the entire distance from Vancouver (over 400 miles) and claim they made $4 per day by so doing. Another thing I wish to state about this stage ride is that the small stations being more than thirty miles apart, yet their road far surpasses anything in the line of roads I ever beheld in Nevada county.

This mine is located on the south fork of the Quesnelle river, and is under the superintendency of J. B. Hobson, formerly of Placer county. At present the bank of gravel is 300 feet high, and as they follow it into the hill, it will become deeper. They have a line of twenty-two-inch pipe and one of eighteen-inch leading into the mine, with a pressure of 296 feet. These pipe lines feed two monitors of the Hoskins patent, using seven-inch nozzles. Their flumes are six feet wide and have ten-inch drop in twelve feet. Taking it all through, it is a well-equipped hydraulic mine, and, under the able management of Mr. Hobson, supported by T. D. Deasy, his foreman, formerly of Columbia Hill, Nevada county, should give big results to the shareholders in the near future.

I will quote prices on a few of the miners' supplies: Crack-proof gum boots, $10 per pair; flour, $8 to $10 per cwt.; pork, 25 cents per pound; rice, $15 per sack; eggs, $1.25 per dozen, and none at that; chickens, $3 each.

The wages here do not exceed those paid in Nevada county, and I would advise any one to stay in Nevada county unless assured of a job before starting, as there are three men here now for every job.

THE war between Japan and China was expected to show what the world might look for from the first-class war ships and guns which all nations have lately been arming themselves with. It was expected that one side or the other would very quickly collapse under the terrific fire which each could pour into the other. It was the Chinese war vessels that gave in almost at the beginning. But on land the Chinese showed the same inability to make a desperate fight under fire. So the authorities are as much at a loss as ever. It is not ships and guns that have been tested, but men. It is, indeed, "the man behind the gun" to whom the praise for success is due. In all the wars in which this country has been engaged American superiority has been plainly manifested, and this has been true on the sea, when American vessels were pitted against British ships.

The Silver Problem.

To the Editor:—There seems to be so much confusion in the minds of people generally in regard to what "free coinage of silver" means and also about the aims to attain it, that a brief outline of it might be given here to advantage: In the first place, if we had an ample volume of money in the world there would be no need of any further silver coinage; and this being the case, the decision of the question as to how much money we really need seems to be the hinging point. Then, unless we consent that the earnings of money loaned should be greater than those of productive industries of all kinds, we must finally determine that unless we secure such a volume of money as would, by its plenitude, cheapen money and increase the price of everything else that is now so much lower than the money-lender's profits, the rates of profit for lending money must continue to remain so disproportionately high as to perpetuate our dull times. To illustrate: For the thirty years between 1860 and 1890 the increase of wealth in this country, as an entirety, was only about 2½% per cent per annum; in other words, money lenders and everybody else were only entitled to 2½% per annum increase or interest on their investments for that time. If any industry or interest got more than that it received more than an equitable share, and the other industries and interests had to be impoverished as a consequence in the degree that one or more got over 2½%.

Interest on money in California averages over 8% per annum, as shown by the census reports. It is no doubt cheaper in some Eastern States. Accepting 8% as the basis of estimate for money's interest and 2½% as the increase of wealth in the whole country, we find under the law of proportion that with $24 per capita as the present amount of circulating medium in this country, we need at least $96 per capita in the United States to bring the earnings of money down to the earnings of other things, or four times the volume of money we now have.

Hence "free coinage of silver" means more money, and the great struggle to attain it means the people's great desire to throw off financial bondage. The following are some of the results that would be accomplished by free coinage:

Many millions of people would, directly and indirectly, be put on a living basis at once in the production, reduction, transportation, etc., of the metal.

The increase in the volume of money it would give to the world, with the advanced price it would place upon commodities, would enhance the share of the wealth falling to the industrial element of our population by many billions of dollars.

It would double the present price of wheat, cotton and all the other staple products of this country, and at the same time double the price of the land upon which they are raised, as was the case in the early '50s when so much gold was being produced.

It would restore the original value to those who invested, under the sanction of law, in about one billion dollars' worth of mining property. These were vested rights and were confiscated by law, by the demonetization of silver.

If other former bi-metallic countries refused to adopt free coinage, our doing so would give us practically all of the trade of the 700,000,000 people using the single silver standard.

There is only four billion dollars of silver money on the globe, with 4000 years of production. If all of it were in the United States and if it were all coined into our money, it would give our population less than $60 per capita, or only about two-thirds of the amount we need right now. Hence, as we could absorb it all and still have only two-thirds of enough (granting that we would have no other money), we can certainly, as a nation, undertake free coinage alone, without the consent or assistance of any other country or Government on earth. And that is what our Government should do, and do it immediately.

No sane-minded person will attempt to say that if our Government made silver money full legal tender in all amounts, the public generally would refuse to accept it. The law would not only force them to do so in that case, but they would gladly do so. Further, the whole world would be glad to accept it, for the reason that they could buy our products with it in that case. The outside world will always honor any of our money that we will ourselves honor, for the reason that they can buy with it anything we have to sell.

The wicked statements that we cannot resume free coinage without any international agreement whatever are a mixture of cowardice, ignorance and falsehoods. Many men, knowing better, make the statement for the purpose of misleading.

With gold and silver combined (if no other kind were used) there is not one-tenth of enough money in the world to give a just and equitable distribution of the wealth of the world to those who produce it.

The bankers' congress sitting in the national capitol at Washington, misrepresenting the people, tells us that if we had free coinage all the gold would leave the country. Our eighty years of free coinage previous to 1873 showed that our ratio of 16 to 1 drove all the silver to foreign countries, and brought us their gold. The reason was that Europe's ratio is 15½ to 1 and India's and China's is 15 to 1, so that our ratio being more in favor of gold than theirs, which means that we offered more for gold than they did and that they offered more for silver than we did, by the respective ratios, the two metals each went to their highest markets.

Gold and silver are twin sisters, rocked in the same rock-ribbed cradle by Nature. What God hath joined together let no man put asunder! Gold is never found in quartz without the presence of silver, but silver is sometimes found without the presence of gold.

Gold and silver would not be mined at all simply as commodities, as the shutting down of the silver mines of the country to-day practically illustrates; and there is not a single one being opened at the present time. Their money uses give gold and silver at least three-fourths of their market price. It has cost at least $1.50 to produce each dollar's worth of gold and silver in the world to-day.

I would say to those who are afraid that if we had free coinage the balance of the world would not accept our money without an international bi-metallic agreement, that they should consider the case of our greenback which goes all over Europe at a premium to-day, simply because it can be returned to the United States cheaper than coin, and it will buy as big a dollar's worth of wheat and pork as a gold dollar will. Now, if our paper dollar with no intrinsic value whatever will pass in foreign lands at a premium, why should not silver, bearing the same stamp and fiat as our paper dollar, pass at least at par?

Remember, there is no such thing as "international" money and from the nature of things there never can be, as the creation of money is always the expression of the supreme function of any Government. But unless a Government in exercising that function endows its own circulating medium with all the powers and qualities of full legal tender, for both public and private debts, it cannot expect other nations to honor that medium, for they will not do so.

One so often hears it stated that none but silver miners would be benefited by free coinage. Let us see if that statement is true, after considering the subjoined very conservative estimate of losses occasioned to our several industries by having half the metallic money of the world destroyed, as was the case when silver was demonetized. The figures are paralyzing in their magnitude, but are under rather than over stated:

LOSSES IN THE PAST TWENTY YEARS THROUGH THE DEMONETIZATION OF SILVER.

Shrinkage in real estate values	$10,000,000,000
Labor of one million (aver.) idle men at $2 a day.	15,000,000,000
Depreciation of silver miners' bullion	250,000,000
Cotton planters' product	3,500,000,000
Wheat farmers' product	7,000,000,000
Corn, oats, etc., farmers' product	7,000,000,000
Cattle, sheep and horse raisers' product	7,000,000,000
Increase of mortgage indebtedness by decreasing ability of debtors to pay, because of scarcer volume of money	10,000,000,000
Excessive interest paid because of restricted volume of money and consequent usury	10,000,000,000
Shrinkage of values in iron industry	5,250,000,000
" " lumber, lime, etc	5,000,000,000
" " all descriptions of manufacturing	10,000,000,000
" " copper, lead, zinc, coal and various sundries (low estimate)	5,000,000,000
Total	$95,000,000,000

It will be noted that the silver miners' proportion of the above loss is only one-three hundred and fortieth, while their proportion of the total investment of the country is only one-sixtieth. The silver miners, therefore, lose only about one-sixth as great a proportion as the agriculturists and other industries. Who, then, in the name of common sense will, in the face of such a marvelous array of facts, contend that the general industries of the country are not interested in again establishing free coinage of silver at the ratio of 16 to 1?

In reading over the above table it will be remembered that the losses shown are much larger than the total valuation of all wealth in the United States to-day. But in this connection it must also be borne in mind that if silver had never been demonetized our total national wealth would be perhaps twice its present amount, by the extra opportunities and stimulus that silver would have given to production and enterprise. Green Majors.

Alameda, Cal., April 16th, '95.

Shasta County Mining Notes.

To the Editor:—When the Iron Mountain changed hands, everybody was hopeful and expected a genuine stir, but it has failed to materialize. The first religious rite the English owners performed was to cut the wages of the old employes and offer the newcomers one dollar per day for underground work. They now have about eighty-five or ninety men employed, about one-third of whom are employed surveying and locating mining claims so as to cut the timber for fuel. Report has it that they are experimenting in the east with the cyanide process and intend to try it before attempting to smelt.

French Gulch has a small mine owned by Ellery Brothers that is producing phenomenally rich ore; thirty tons yielded $2700.

Since the new management took charge of the Gladstone, it is making between $6000 and $7000 net per month. The engineer of the mill, who was arrested with a bar of stolen bullion in his possession, slipped through the meshes of the law by claiming that Mr. Gray, the superintendent, gave it to him for wages. An indictment for Gray for stealing bullion was found by the grand jury, but Mr. Gray was last heard from in Panama on his way to South America.

The old Washington mine in French Gulch is under bond to a New York party.

The Niagara is worked on the tribute system and yields fair results.

Around Shasta and Middle Creek a great many prospects are being worked with the usual results. The mines are bunchy on Flat creek and Spring creek. The same results are obtained at Squaw creek. The Uncle Sam makes as fine a record as the county can boast of. They pay their men and the mine yields handsomely. The Windy Camp mines are still in the same stage of development that they were twelve years ago—just going to do something, but do not get there. In the Old Diggings, Hart's Texas and Georgia runs steadily. They have a big strike periodically once a week the year round, but the mortgages on the property still remain on record, which do not corroborate the statements of the owners.

The Quartz Hill property had a shut-down and general squabble among the stockholders, with the result that the manager was discharged, the trouble being the mine did not pay. They have started up again under the management of the president.

The base range of Shasta county extends for a distance of thirty miles. It commences at Iron Mountain and runs northeast and then swings south to Furnaceville, or the old Afterthought mine.

The best dividend-payer in the county for the investment is the dredge working in the river. It cost about $3000 and earned $5000 net for the owners last summer. This year they have doubled its capacity and will double the yield. They dredge out boulders weighing over a ton and get the best pay in the boulder ground. Two other dredges are being constructed by other parties, and river dredging has become a factor in mining in this section. F.

Books Received.

"*Motive Powers and Their Practical Selection*" is a new work on an old subject by Reginald Bolton, who dedicates it to the Institution of Civil Engineers of England and the American Society of Civil Engineers. Every application of power: manual and animal; wind and water; steam and gas; hot air and electricity, receive practical comment, the book being a clever compilation of facts gathered from a variety of authentic sources. Valuable tables, formulæ, etc., are presented and in all cases the cost of the means of power under discussion is given.

Argument or opinion has little place, the author almost entirely confining himself to statements of fact, and an honest effort is evident to be fair and unprejudiced in all his assertions, and its practical nature makes the work of value to any man having anything to do with the subject of which it treats. It contains 252 pages, octavo, and is handsomely issued by Messrs. Longmans, Green & Co., 39 Paternoster Row, E. C., London, England, and 15 East 16th St., New York City.

"*Elements of Mineralogy, Crystallography and Blowpipe Analysis, from a Practical Standpoint*, including a description of all useful minerals, the tests necessary for their identification, the recognition and measurement of their crystals, and a concise statement of their uses in the arts," by Alfred J. Moses, E. M., Ph. D., and Chas. Lathrop Parsons, B. S., is received from the publishing house of D. Van Nostrand Co., 23 Murray St., New York City.

In this book of 342 pages, inorganic nature receives plain and practical exposition. Part I is devoted to a description of the crystalline structure of minerals, their form and the laws that govern its construction; part II is a treatise on blowpipe analysis; part III (probably the most interesting to the general student) is devoted entirely to descriptive mineralogy: simple, accurate and concise; part IV treats of determinative mineralogy, giving several valuable test tables, by use of which the presence or absence of the principal minerals can be determined. The book is of value to the practical miner or metallurgist. It contains over 300 figures or delineations of mineral crystallization and is so arranged as to readily yield the information desired.

Sierra Buttes Mining Company.

The accounts of the Sierra Buttes Mine for the half-year ended December 31st last show, including £2964, the moiety of profit from the Uncle Sam Mine, a balance to the credit of profit and loss of £3608. Out of this the directors recommend a dividend of 6d. per share, free of income-tax, £3062, a balance of £546 being carried forward. The accounts of the Plumas Eureka Mine for the half-year show a profit for that period of £4759, inclusive of £2964, the moiety of profit from the Uncle Sam Mine; this, with the balance brought forward, enables the directors to recommend that a dividend of 9d. per share, free of income tax, be declared, and that £4802 be carried forward.—Loudon Mining Journal, March 23.

The American Institute of Mining Engineers are on their annual excursion this time to Florida, leaving Washington, 125 strong, under charge of Dr. David T. Day, of the geological survey.

The Crawford Mill.

Herewith is presented a sectional cut of the Crawford Gold Extractor, a mill for which many advantages are claimed by its makers, who say that "from actual experience of this mill, and from the most careful study of its operation, it may be pronounced almost perfect as a gold saver."

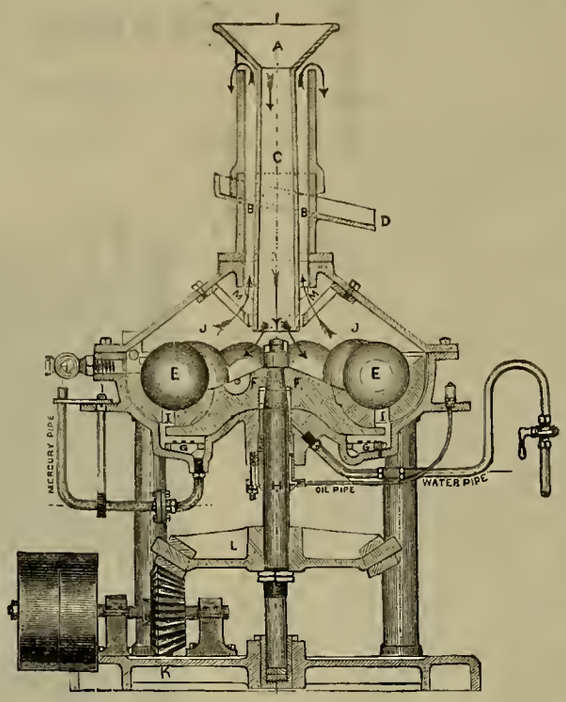
The ore is fed into the conical-shaped hopper *A*, passes downward in the direction of the arrows through the tube *C*, and falls upon the rotary disc *F F*, which throws the ore with force under the balls *E E*, where it is ground to an almost impalpable powder (from 100 to 200 mesh), the gold particles alone, owing to their specific gravity, falling through the space *I I* into the mercury bath, *G G*.

Rapid motion is imparted to the balls by the disc *F F*, which makes about eighty revolutions per minute. The water entering through the water pipe passes under the rotary disc *F F*, and flows over the mercury *G G*, then upward through the opening *I I*, and, filling the space *J J*, carries upward the tailings in the direction of the arrows, through the neck *B B*, and flows out over the top, the tailings going to waste at *D*.

The rotary motion of the water in the mill is checked by the flanges *M M*, and also by flanges on the neck of the hopper, *B B*. By this means the violent agitation of the water ceases before it overflows the top, and thus the fine particles of light gold are not borne away but settle back into the mill and eventually reach the mercury. *H* is the vertical shaft which gives motion to the disc *F F*. Motion is imparted to the shaft *H* by a bevel gear *K* and *L*.

The mill is constructed on the arrastra "pan-type" principle, the ore crushing being effected by steel balls set rotatively on two half-circle annular grooves, the inner one being the periphery of a convex disc, running at a speed of about eighty revolutions per minute, the outer a fixed ring. A space between these two "seat grooves" of one-half inch forms the entrance to an annular trough containing quicksilver and placed at the bottom of the pan below the ball seat.

The transmitted power being below the pan, the ore, broken to the size of not more than one-half-inch mesh, is fed in through a hopper head, falls on the pan about twelve inches and comes in coutact with the crushing balls. A steady stream of water under pressure enters the mill from below, plays over the quicksilver, and then flows upward into the body of the mill. The ore is held in suspension until it is ground into impalpable powder by the balls, the gold particles alone, by their specific gravity, dropping down into the naked quicksilver. The tailings as residue, instead of leaving the mill at the point below the crushing level, through screens or amalgam plates, as in stamp or other crushing systems, has to rise with the water through a grating and flow off at the feed elevation. Notwithstanding its simplicity, the mill combines in itself a grinder, pulverizer, amalgamator, settler and cleaner-up.



SECTIONAL VIEW OF THE CRAWFORD MILL.

It requires 12 H. P. and about four gallons of water per minute. This mill was introduced upon the market some three years ago. It is claimed but a single fault has been found with it, and that, its excessive wear and tear on some ores. This defect, however, the manufacturers say has been overcome, a special steel having been finally adopted, by the use of which the wear and tear is reduced to a maximum of thirty cents per ton of ore treated. The foundation for the mill is inexpensive and can easily be constructed in a day.

The mill, in its present form, is not advocated for use on ores carrying more than fifteen to twenty per cent of sulphurets, as an increased percentage reduces proportionately the capacity of the mill. Its average capacity is ten tons.

There is but little, if any, loss of quick, and millmen will appreciate one unique feature, namely, the amalgam is accessible only when the mill is partially dismantled to effect the periodical cleanup.

Several mills have recently been sold to companies in Baker City and Huntington, Oregon, and Wallace and Kendrick, Idaho. At the Northwest Development & Investment Company's mine, in Wallace, a trial run recently with one of these mills, during eight and a half days, yielded a cleanup of 98½ ounces, or a saving of nearly ninety per cent. Three mills in operation for the last three years at Kane Springs, Utah, report a saving of over eighty-five per cent on refractory ore.

The mill is controlled and manufactured by the Mechanical Gold Extractor Company, 47 Broadway, New York City; W. O. Ross, secretary.

THE annual meeting of the American Association for the Advancement of Science will be held in this city during the second week of next August.

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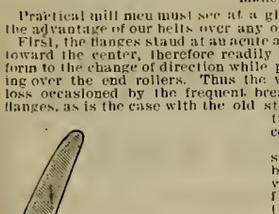

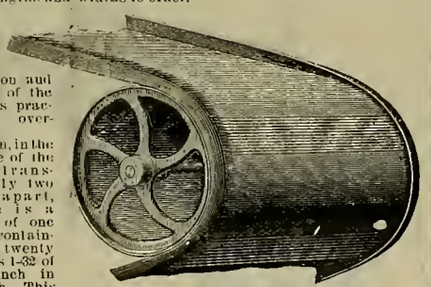

Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome. Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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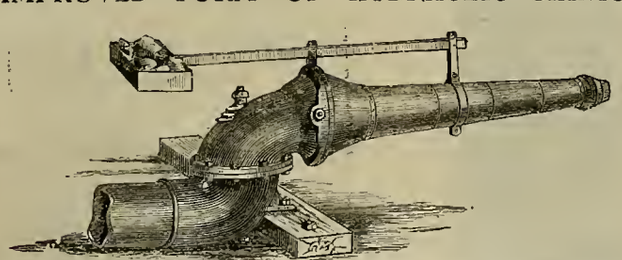

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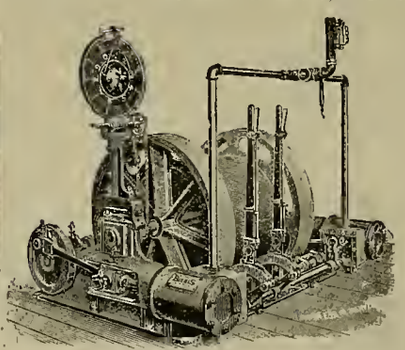

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JAMES H. LANCASTER, Patentee, 39 Cortlandt St., NEW YORK.

Scientific Progress.

Terrestrial Helium.

Lord Rayleigh, the first to isolate from the air the gas argon, whose existence was never known until last year, is now said to have made another very interesting discovery. Chemical analysis of the substances composing the earth's crust has thus far revealed nearly seventy distinct elements; and spectroscopic study of the sun has already detected the presence of more than half of them in that body. But there are indications that the sun contains a few elements which are yet unrecognized in terrestrial matter. For instance, there is a line in the green part of the spectrum of the outermost solar envelope, the corona, which is thought to represent a gas much lighter than hydrogen. The line itself is numbered 1,474 in the old Kirchhoff scale, but in Rowland's, which is the modern standard, it is set down at 5,316. The substance itself is called "coronium." Nothing of the sort has been found on the earth. Again, when the spectroscopists examine the chromosphere, the layer of gas next below the corona, but lying above the luminous cloud-shell of the sun, they discover in the yellow a brilliant line, which they used to call "D3," but which is situated at 5,876 in Rowland's scale. No line could be perceived at this point in the spectrum of any terrestrial substance, and hence the element thus signified was, like coronium, regarded as peculiar to the sun. Indeed, such a supposition is embodied in its name, "helium." Since the first discovery of the D3 line, however, the latter has been recognized in the spectra of a few stars, which are also suns, but many million times as far away from us as our own. And now comes the report that Lord Rayleigh has just found helium in a rare mineral from Norway.

This famous chemist was testing a rock specimen, with sulphuric acid. Such tests of that particular mineral have been made before, and they always yielded a gas. Heretofore the latter has been believed to be nitrogen merely. But Lord Rayleigh perceived that it was argon; and, what is more, that some other gas was combined with it. As this sort of experience is precisely what led him to make his brilliant discovery of last year, one can readily understand the zeal with which he sought to ascertain the nature of the adulterating gas. His further investigation led him to identify it with helium! Another eminent expert, Professor Crookes, has confirmed this conclusion.

From the particular region in the sun in which helium is found, and from its immediate and intimate associations, this gas is looked upon as being one of the lightest materials composing the body, possibly as light as hydrogen. Wilsing, a leading German astronomical spectroscopist, is inclined to think that helium resides chiefly in the upper part of the chromospheric sheet, which would suggest the idea that, like coronium, it may weigh even less than the gas in whose company it has usually been hitherto. Some researches of Gruenewald, in which Professor Young placed confidence, indicated that possibly helium and coronium were components of hydrogen, and were partially dissociated by intense heat; but this theory seems to be effectually disposed of by Lord Rayleigh's ability to obtain the gas at very ordinary temperatures, and in combination with argon.

One of the principles on which stars are classified is that of resemblance and difference between their spectra. And in such classification various attempts have been made to indicate the stage of advancement attained by each particular orb in its life history. Dr. Scheiner, whose book on stellar spectroscopy is not only the latest but probably the ablest work of its kind extant, puts those stars whose spectra contain the bright lines of helium and hydrogen in the first sub-division of his first class, in point of evolution. Beta Lyræ and Gamma Cassiopeiæ are two such stars. He fancies that they have atmospheres composed of those gases, enormously extensive as compared with those of other stars, and possibly hotter than the gaseous envelopes of their older companions. In view of these theories one cannot but ask how long it is since our world was in the condition of Beta Lyræ, whether any helium now floats in our outer atmosphere, how that particular portion which is now imbedded in the earth's crust got there, and other similar questions.

A New Blasting Powder.

Several of the explosives used in blasting within the last few years have been combinations in which chlorate of potash forms a conspicuous element. With petroleum it makes "rack-a-rock;" with saltpeter and crude gamboge the "oriental powder," once used in opening oil wells in Pennsylvania, and with potassium-ferro, ferri-cyanide and sugar an article known both as "white gunpowder" and "German gunpowder." This same salt has also been mixed with sulphur and various other materials for the same general purpose. A new compound of the chlorate, with sugar only, is now reported from South Africa. It is called "thorite," probably after the Scandinavian god of thunder, Thor. For several months this explosive has been tested in coal mines at Vereeniging and elsewhere, with excellent results. It is said to be almost as powerful as dynamite, weight for weight, cheaper to make, and virtually free from unpleasant fumes. Sir Frederick Abel, one of the inventors of cordite and a leading authority on explosives in England, has sent an expert to Capetown to establish a laboratory for further experiments. Wherein the superiority of thorite over other potassium chlorate powders lies is not indicated in the brief press notices of it at hand. In some of the mixtures used, especially those containing resinous gums, the particles become consolidated by heat, a result impairing the efficiency of the product, and one which it would not be safe to overcome by trituration. One would anticipate that moisture would affect sugar in a similar way. But possibly thorite is guarded from damp air scrupulously until it is used.

THE greatest height of any cloud yet measured is 43,800 feet, and the highest velocity is 112 miles an hour for a cloud at 28,000 feet. The most important result thus far reached from these measurements is the fact that clouds are quite regularly distributed in three layers, the mean summer levels for Upsala being: low clouds—stratus, cumulos, cumulo-nimbus: two thousand to six thousand feet; middle clouds—strato-cirrus, cumulo-cirrus: twelve thousand to fifteen thousand feet; high clouds—cirrus, cirro-stratus, cirro-cumulus, twenty thousand to twenty-seven thousand feet.

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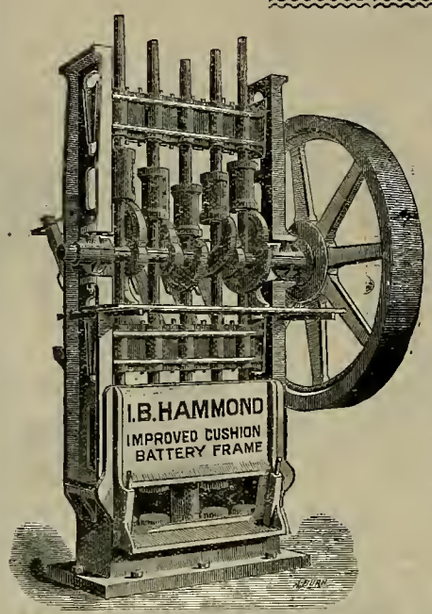

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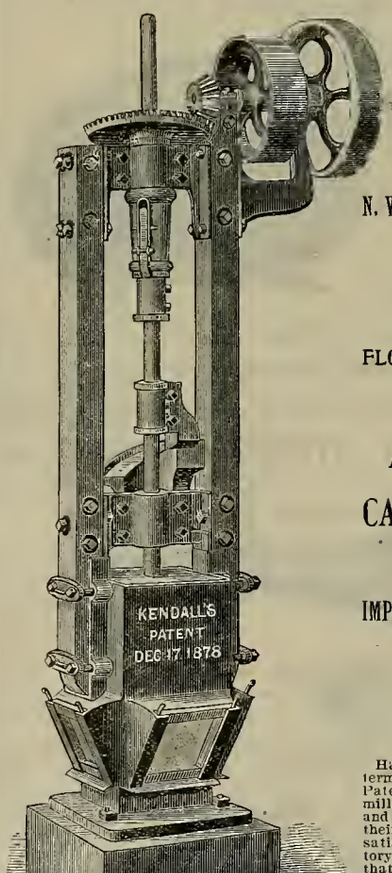

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Mechanical Progress.

How an Ax is Made.

On entering the main workshop the first step in the operation which is seen is the formation of the ax head without the blade. The glowing flat iron bars are withdrawn from the furnace and are taken to a powerful and somewhat complicated machine, which performs upon them four distinct operations, shaping the metal to form the upper and lower parts of the ax, then the eye, and finally doubling the piece over so that the whole can be welded together. Next, the iron is put in a powerful natural-gas furnace and heated to a white heat. Taken out, it goes under a tilt hammer and is welded in a second. This done, one blow from the "drop" and the poll of the ax is completed and firmly welded. Two crews of men are doing this class of work, and each crew can make 1500 axes per day.

When the ax leaves the drop, there is some superfluous metal still adhering to the edges and forming what is technically known as a "fin." To get rid of the fin, the ax is again heated in a furnace and then taken in hand by a sawyer, who trims the ends and edges. The operator has a glass in front of him to protect his eyes from the sparks which fly off by hundreds as the hot metal is pressed against the rapidly revolving saw. The iron part of the ax is now complete. The steel for the blade, after being heated, is cut by machinery and shaped. It is then ready for the welding department. A groove is cut into the edge of the iron, the steel of the blade inserted, and the whole firmly welded by machine hammers. Next comes the operation of tempering. The steel portion of the ax is heated by being inserted in pots of molten lead, the blade only being immersed. It is then cooled by dipping in water, and goes to the hands of the inspector. An ax is subject to rigid tests before it is pronounced perfect. The steel must be of the required temper, the weight of all axes of the same size must be uniform, all must be ground alike, and in various other ways conform to an established standard. The inspector who tests the quality of steel does so by hammering the blade and striking the edge to ascertain whether it be too brittle or not. An ax that breaks during the test is thrown aside to be made over.

Before the material of the ax is in the proper shape, it has been heated five times, including the tempering process, and the ax, when completed, has passed through the hands of about forty workmen, each of whom has done something toward perfecting it. After passing inspection, the axes go to the grinding department, and from that to the polishers, who finish them upon emery wheels.—Blacksmith and Wheelwright.

Rating of Feed Water Heaters.

The Feed Water Heater Manufacturers' Association, composed of seven companies manufacturing closed feed-water heaters, has issued a circular in which the resolutions recently adopted are printed. The resolutions set forth the belief of the association that the only proper rating for feed-water heaters is based on the square feet of heating space on the heater, that they agree to specify the square feet in each heater on which a price is quoted, and that they will "in each and every case state without reservation, both in printed catalogues and in specifications, the diameter of the tubes, the number of lineal feet thereof and the total square feet of heating surface in each heater offered."

It also says that "the term H. P., as applied to feed-water heaters, is an exceedingly loose and indefinite phrase. The work which a feed-water heater has to do depends upon the number of pounds of water in the shape of steam that an engine requires per hour."

The following is also printed in the circular: "A simple engine, of the cheapest grade, may use say fifty pounds of water per H. P. per hour; an average engine will use perhaps thirty pounds of water, while a high-grade engine will cut the consumption of water down to something like fifteen pounds per H. P. per hour. Again, the steam which is used to heat this water will, in the case of a simple engine, have a temperature of 212°, while in the engines of high grade it may have to do its work with a temperature of less than 150°."

The subject was recently discussed in the American Society of Mechanical Engineers.

Some Comparisons Bearing Upon Engineering Construction.

Some comparisons of an important practical character, in their bearing upon engineering construction, have recently been made by Professor Thurston. From these it appears that cast iron weighs 444 pounds to the cubic foot, and an inch-square bar will sustain a weight of 16,500 pounds; bronze, weight 525 pounds, with a tenacity of 36,000; wrought iron, weight 480 pounds, with a tenacity of 50,000; hard "struck" steel, weight 490 pounds, with a tenacity of 78,000; aluminum, weight 168 pounds, with a tenacity of 26,000. Singularly enough, if equal weights of metals and wood be compared, it is found that several varieties of wood are stouter than ordinary steel. Thus a bar of pipe just as heavy as, but no heavier than, a bar of steel an inch square will hold up 125,000 pounds, the best ash 175,000, and some hemlock 200,000, but the bulkiness of wood is a great objection. The tenacity of the best steel castings made for the United States navy is given as from 65,000 to 75,000 pounds to the square inch. By solidifying such castings under great pressure, double that tensile strength has been reached.

Not Following Instructions.

In criticising the lax methods used by certain people in handling tools or new devices, a writer in the *Plumbers' Trade Journal* says that manufacturers are afraid to send out anything new, scientific or novel, for they know into what hands it is apt to fall. All new stuff should bear a tag inscribed as follows: "Do just the opposite to what you think is right, and this fixture will work perfectly." In the good old days, it took five years to learn plumbing, but now an intelligent man could, in five days, learn more than a great many who command first-class wages know. In days gone by, plumbers were never known to say a thing was complicated. They were glad to have ideas that were puzzling. To be able to make repairs on over two hundred different kinds of valves was their stock in trade, and a lack of this knowledge barred out pauper competition. To-day if a tramp is unable to get an article to work, it is condemned, and the trade is reduced simply to delivering the materials on the ground and distributing them to their various positions, the same as chairs or bedsteads.

Bridges of Old Rails.

New economies suggest themselves quickly in these days, and one of the latest to crop up on the surface is the construction of railway bridges out of old rail. The Baltimore & Ohio road has two of these structures built out of scrap such as accumulates in the stock of any line. The old rails were valued at $9.50 a ton. The angles from which the hangers were made were of short lengths that were spliced at their centers. All gusset plates were cut out of old web plates which had been punched for other purposes. The two bridges were constructed in the repair shops of the company and required but the simplest tools in their manufacture. The advantage of this curious innovation is that the old rails, which are always on hand, can be utilized, and the cash outlay is so small on the whole job that the total cost is brought well within the price at which the cheapest wooden bridges can safely be built.

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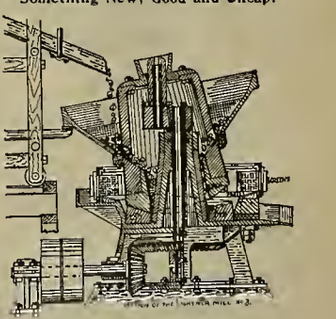
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

THE ALPINE MINE.—*Republican:* The prospecting operations at the Alpine mine, in Plymouth, have led to the discovery of a three-foot vein of excellent rock. The strike promises much for Plymouth. The town has been in a depressed condition for seven or eight years—ever since the fire which put the quietus on the Plymouth Consolidated mine. Brief intervals of mining excitement have raised hopes of better times two or three times since, but have proven delusive. The cutting of a fair-sized ledge of pay ore, right in the town limits, gives more substantial hope of restoring the town to prosperity than anything that has taken place in that vicinity for years.

MISCELLANEOUS.—The five-stamp mill of the Smith Brothers on the Clough place, near Volcano, is still idle. It is probable that the idleness will not be of long continuance. It is reported that the ore in the test crushing yielded $4 per ton. With a mill of one battery of course it would not pay. It is doubtful if rock of that average could be made to pay with a 10-stamp mill. With 20 or 40 stamps, however, it ought to be made to pay a handsome profit. There is said to be a large body of ore, equal to keeping a fair-sized mill in active operation.

The Clinton Bar Company have been engaged in rearranging their machinery for the better working of their rich gravel claim on the Mokelumne river.

The sum of $1000 was paid by D. Gutmann, in behalf of the Alma Mining Company, to Rube and Jefferson Boxall last Friday, being the first installment on the bond for all the Boxall interest in the Alma ground. The price is $5000, and the time expired on the 5th of April. The company paid $1000 on the price, and secured an agreement extending the time for the balance of $4300 until the 5th of June. This payment is a guarantee that the purchase will be consummated.

Calaveras.

THE TABLE MOUNTAIN MINE.—It is expected that the new ten-stamp mill at the Table Mountain mine will be ready for operation by May 1st.

Mariposa.

MAKING PROGRESS.—*Gazette:* The Merced Mining Company is having a road built from the Malvina mine to Coulterville. At the Potosi mine preparations are being made to put in a compressor to run the Burleigh drills, and the Potosi and Malvina are both being connected with the main shaft by tunnels. The shaft at the Mary Harrison is being retimbered. Work on the ditch to convey water from the south fork of the Tuolumne river will soon be begun.

ACTIVE OPERATIONS RENEWED.—W. S. Chapman returned from Mariposa during the week. His company has the old Hite mine and will go ahead with work this summer. Everything in and around the mine is just as it was ten years ago when the air compressor broke. The first thing Mr. Chapman and his associates will do is to pump out the mine; then begin work on the 300-foot level. The Hite was a big producer and gives promise of even greater productiveness.

Mr. Chapman is also interested in the Vanderbilt, 13 miles from Mariposa, now known as the Sunset. The ten stamps now there are to have ten additional, and the twenty will pound this summer.

Nevada.

THE CEDAR MINE.—*Tidings:* The Cedar mine, about twelve miles below Grass Valley, is looking exceedingly well. This mine is in charge of Jas. R. Nickerson. There is now a twelve-foot ledge of quartz in the mine and assays from portions of it have gone above $60 per ton. The rock is uniformly good.

THE W. Y. O. D.—The W. Y. O. D. mine, which has one of the best plants of any mine in the district, or State, will soon have ten additional stamps to grind out the precious metal.

The company is now considering bids for the new improvement and there will be no delay in having the work done as soon as the contract is let. The Union learns from a reliable source that the mine has shown great improvement of late in the quality of the ore, which warrants going to the expense of increasing the capacity of the mill. In fact it may be said that dividends are again in sight.

The work of running the drift and sinking the shaft have been vigorously pushed and the mine is so well opened that the full force of men can be employed in stoping the quartz when the capacity of the mill will admit of crushing all the ore that may be extracted through it.

The principal work is now being done in the shaft and the 1300, 1200, 700, and 1000 levels.

Fifty men are employed at the W. Y. O. D., nearly all of whom are on day's pay.

THE GOLD RIDGE MINE.—*Tidings:* The Gold Ridge mine, in the northern part of the county, not far from North Bloomfield, is making arrangements to put up a forty-stamp mill. They have an immense ledge of quartz, and they are running a tunnel, which is in about 200 feet, for a gravel channel which is known to be rich. The mill site will be located in Sierra county. Richard Phelan is superintendent of the Gold Ridge.

THE NATIONAL.—The National mine, located one and a half miles from Graniteville, has begun operations after having been closed down during the winter on account of the ditch being blocked with snow. The National ordinarily employs twelve to fifteen men.

GOOD RETURNS.—*Tidings:* Three tons of quartz from the Morgan and Tilley ledge in Willow valley were recently shipped to San Francisco and treated by the Selby Smelting Works. It brought over $70 to the ton. The ore is rebellious and does not pay by the ordinary milling process.

A GOOD SHOWING.—The *Transcript* says the amount of money paid out for labor at the mines in that district during the past month was larger than has been paid out in one month for a similar purpose in many years before. It is also said that the number of men engaged in mining exceeds considerably what it has been for many years. "This improvement has been steady and substantial and the increase in the number of men employed has been gradual and is likely to continue in the same way for several months. We have men enough, however, as the demand will not be sudden, and therefore it is an easy matter to get miners whenever they are wanted."

Placer.

WILL PUT UP A MILL.—The Bella-Union quartz claim adjoining the Pike Bell five-stamp mill on the American river, assays rich ore. Such a good showing is made that the company is putting up a mill. They have enough ore in sight to pay all expenses. The Pike Bell adjoining is milling rich ore.

Plumas.

THE FOUR HILLS.—*Independent:* Operations will be resumed at the Four Hills quartz mine this summer. This mine has not been operated for some years.

Riverside.

A FINE LEDGE OPENED.—*Record:* A well-defined ledge has been found in the Golden Chariot mine, six miles west of Perris. It is the intention of the owners of the mine, Messrs. Day & French of Redlands, to sink on the ledge until a supply of water sufficient to run a mill is found. The Golden Chariot is an extension of the Santa Rosa, and 150 feet higher on the surface. Water was found in the Santa Rosa at a depth of 200 feet, therefore it is computed that a shaft 350 feet on the Golden Chariot will be necessary to develop an adequate supply of water. The Golden Chariot ledge is said by many to be the mother lead of all the Pinacate mines.

THE SUNNYSIDE MINE.—This mine, located three and a half miles southeast of the Good Hope, is now down forty feet and has a three-foot ledge assaying $25 in gold and $4 in silver to the ton. It is a promising property and grows richer as depth is attained. The statement that $100 and $200 ore had been found in the mine is entirely erroneous. The mine is a good one, but statements to the effect that $200 ore is being taken from a ledge that produces ore worth only one-eighth of that amount are discouraging to mining districts, and their truth should be enquired into before they are given to the public.

San Bernardino.

A RICH STRIKE REPORTED.—A private letter reports a rich strike in the Rose mine in Lone Valley, made on the 450 ft. level, which was drifted on for 45 feet and sunk on for 55 feet. There is eight feet of high grade ore, some of it going $200. The rock is limestone and mica schist. The new strike appears to be in the west end of the mine.

Shasta.

GENERAL MINING NOTES.—*Democrat:* Ellery Brothers, at French Gulch, ran their Huntington mill two days last week and cleaned up $500. This makes $2180 from seven days' run. The ledge has widened from four inches to three feet.

The Gladstone Company keeps the mill going steadily. The Washington also shows a fine ore body.

A bunch of high-grade copper ore has been found near Whiskytown.

Col. Connors has struck a very rich ledge of coarse gold and free-milling gold on Boulder creek.

At Muletown a Mr. Haskall has bonded nearly everything in sight, the Dobelin and Whit George claims being among the number.

Fred Grotefend has bonded the Afterthought and Donkey mines at Furnaceville. An Eastern party talks of erecting antimony works there.

It is rumored that the Northern Light and Bully Hill properties are sold to a Los Angeles party. Mr. Book is the middleman.

It is also rumored that R. M. Sæltzer and Judge Reed have bonded the Winthrop. A party has also bonded several claims carrying base metals near Bass' store on Pitt river.

At Iron Mountain the company now have about 100 men at work. The going wages are $1 a day and grub.

R. G. Hart, in Old Diggings, talks of putting in twenty more stamps.

J. M. Gleaves has just finished surveying the Central group for a patent.

Charley Dozier of San Francisco has just finished sampling the Hendy property in Old Diggings, and has shipped a carload of ore to Frisco.

W. P. Miller has 200 tons of ore out and is hauling it to his mill at Middle Creek.

Siskiyou.

MINING NOTES.—*Journal:* The Espey Mining Co. has completed the extension of the electric light plant ditch at Shasta river, and securing foundation for the pump is progressing rapidly, with most of the machinery hauled to the ground. As soon as the pump is set in place, the extension pipe will be laid to the top of the hill, and a large flume built at the same time from top of hill southward to the claim near the town of Hawkinsville. It is expected the company will be able to commence work with giants and in sluicing before the 4th of July next.

The Schroeder mine on Deadwood mountain is being worked and the mill kept well supplied. There is a good deal of snow yet in the vicinity of the mine, but will soon be gone.

NEW STAMP MILL.—The new stamp mill of the Black Jack Mining Co., at Hornbrook, is finished, and about thirty men will have employment there this summer.

Sierra.

MINING PROPERTY ATTACHED.—Downieville *Messenger:* A heavy attachment was levied upon the Gold Bluff Mining Company's property last Monday afternoon. We understand that Mr. Hobbs, on behalf of the electric company which furnished the electrical machinery to the mine, filed the first lien, whereupon John Costa put on an attachment for about $10,000 due him. This was quickly followed by the workmen levying a miner's lien upon the property, which has since been assigned to John Costa, he buying them all in. The total attachment will aggregate nearly $20,000. The cause of this cannot be attributed to the failure of the mine's production, but is no doubt due to an endeavor on the company's part to erect costly outside improvements, and the failure of the stockholders, who live in New York, to respond.

NEVADA.

Lincoln.

PHŒNIX MILL.—*Record:* The mill of the Phœnix Reduction Co. at Bullionville is now running steadily on a lot of ore from the April Fool mine, in Ferguson district. After this is run through, a lot of gold-bearing rock from the Flagstaff mine will be worked there.

Lyon.

A PERMANENT CAMP.—Dan De Quille: Silver City is the mother gold camp of Nevada. Work began on the gold-bearing veins of that place thirty-five years ago, and has been in constant progress ever since. Miners who took hold of mines in Silver City in 1859-60 are still there, and holding on to their ground. They have married, reared families and are grandfathers; still their mines do not fail them. Old as is the camp, about as many new discoveries are being made there as anywhere in the country. The permanency of this old camp should encourage all who are interested in the gold mines of Nevada. In every part of the State where paying gold mines have been found, the veins still pay. Barren spots may be found once in a while, but no mine is all "bonanza"—some "borrasca" must be expected.

THE DEAL PROBABLY OFF.—Salt Lake *Tribune:* Charles Legg of Bingham, who went to Elko, Nev., to examine the mines of the Octorora group for Salt Lake parties, has returned, but has not yet filed his official report. He has stated to his clients that the property is not as good as represented, and it is believed that the prospective deal is now off.

SILVER STAR DISTRICT.—*Enterprise:* The Brown mine is the only developed property in the camp. The average grade of the ore is $100 per ton. There is now some $375,000 worth of this ore in sight. The other claims all have pay ore in sight but none is of so rich quality as that in the Brown, the general average apparently being from twenty to forty dollars. There are ten or twelve well defined ledges, but the ledges, with the exception of the Brown, are apparently small, none having been developed.

There are situated on two sides of the mountain. Those on the east side where the Brown ledge is owned, from east to west, and those on the west side from north to south.

There are at present 120 men in the camp. The most of the claims are being worked by lease-holders, and while some of these are making money, they are the exception rather than the rule. The reasons that lease-holders are not as a rule prospering at Silver Star is that the ore is of comparatively low grade, and they having limited capital have much to contend with.

Prices at Silver Star are exorbitant. It costs $6.50 per ton to mill ore in lots less than fifty tons and $5 in lots of fifty tons or more, and few of the lease-holders can wait until they have accumulated this amount. It costs from $1.50 to $3 per ton to transport this ore from the mines to the mills. There being no roads, it all has to be packed on mules.

Lumber costs $40 per thousand. There is plenty of water on the east side of the mountain to run the Douglass Company's mill; but the Douglass Company controls it all. Thus it will be seen that leasers, after paying ten per cent for their mines, have much to contend with.

THE MINING OUTLOOK.—The mining outlook in this State is very promising at the present time. Silver Star district will be a fine camp in the near future. They are talking of mining properities in that district way up in the hundred thousand figures, and the grass roots have hardly been disturbed yet. White Horse district, in Humboldt county, is attracting attention, while the placer mines just north of Reno promise to develop into something worth having, to say nothing of the quick-silver, gold and silver prospects about twenty miles north of Reno. Kennedy district is under a cloud just now, but it has a silver lining and much may be expected of that camp this season. They are all gold prospects, too.

MASON VALLEY GOLD.—Dayton *Times:* W. H. Spragg was in from Mason Valley the first of this week and from him we learn that the new gold discoveries in the upper end of the valley, about six miles from Yerington, are opening up very well. The three principal claims in the district so far are the Mountain Chief, Silver Leaf and Jack Wilson. The ledge in the Mountain Chief is all of two feet wide as far as has been uncovered, and it can be traced on the surface for over a distance of 1,500 feet. Assays from this claim go $150 in gold and $35 in silver. The other two claims, which are farther down the mountain side, are also showing up some good ore, and the ledges are, so far as known, from six inches to three feet in width. Assays from the Silver Leaf go from $7 to $115 in gold and from $4 to $30 in silver. Assays from the Jack Wilson go from $25 to $213 in gold and from $2 to $12 in silver. There is enough ore in sight in the Silver Leaf and the Mountain Chief with what little work has been done, to keep a ten-stamp mill running for a year or more. Messrs. Spragg and Martin, who own these claims, are, in company with a millwright named Nixon from San Francisco, putting up a horse-power arrastra, and will have the same completed and working ore next week. The ore will only have to be hauled about half a mile. These mines are liable to prove bonanzas to their owners at no distant day.

ARIZONA.

LOCATING MINING CLAIMS.—*Journal-Miner:* The passage of the mining law by the recent Legislature seems to have given quite an impetus to the location of mining claims. The law does not take effect until July 1, 1895, and locations can be made previously without one being compelled to do a certain amount of development work prior to recording. During the first two days of the present month forty-three location notices were filed for record, twenty of which were for lithograph stone, and up to noon of the third day eight had been filed for record, making a total of fifty-one notices for the two and a half days.

VICINITY OF YUMA.—A good road has been built by the miners from Blaisdell station to Thomas Camp. The ore there ready for shipment will soon be hauled in to the station and sent to San Francisco.

There are three carloads of tank material at Aztec awaiting transportation for the Harqua Hala Gold Mining Co., to be used in their new plant for working the tailings by the cyanide process.

Seven ounces of free gold have been cleaned up from the waste of the Arizona and Half Moon claims at Thomas Camp. These properties are yielding shipping ore.

"An expert is said to have lately visited the Queen mine of the Golden Cross Company, and estimated the amount of ore in sight at 2,000,000 tons worth $6 a ton. The Queen is something of a blanket ledge, lying at an angle of about 30°." This is from the Yuma *Times.*

Grading has been resumed on the site for the sixty-stamp mill at Golden Cross. Some of the timbers will soon begin to arrive. The new site is well up on the side of the hill and affords plenty of room for tailings. When the sixty stamps are ready to run, the present forty-stamp mill will be set up alongside of them, making 100 stamps in a string.

AROUND JEROME.—The Jerome *Chronicle* says: Charles Ward has bonded the Copper Matte group of mines, consisting of four mining claims, as follows: Copper Matte, Black Hawk, Wizard and Daunted. He has interested L. P. Drexler in the property, who purchased a two-thirds interest, and Mr. Ward a one-third for himself. Mr. Ward says they paid $10,000 for the whole group. The claims are on what is called the "south end" lode, and two and one-half miles south of Jerome. The development done on them consists of a forty-foot shaft, showing good ore as it went down. At the bottom the ore is of better grade. The shaft is still in ore which carries gold, silver and copper. Mr. Ward informs us that they intend to put up a steam hoist, build a road and sink the shaft deeper. The future will depend upon what Mr. Drexler's views may be after he arrives from San Francisco and makes an examination of the property.

BRITISH COLUMBIA.

THE JOSIE.—Nelson *Tribune:* R. E. Lemon is either lucky or unlucky. Last year when he sold his interest in the Josie, a Trail creek prospect, for $7,000, he thought he was playing in good luck. Were he to see the Josie today, he would think he played in bad luck. The whole width of the lower tunnel is in ore, and the walls are as well defined as those of a plastered house. The ore body is between five and six feet wide, the ore is clean, and the grade is higher than the ore from either the Le Roi or War Eagle. The face of the tunnel is nearly 200 feet from the surface, and experts reckon the Josie to be worth $100,000.

LE ROI WILL MAKE THINGS HUM.—At a recent meeting of the board of trustees of the Le Roi Mining Company, Manager I. N. Peyton was instructed to purchase immediately for the use of the company an additional boiler of 100-horse power and a new hoist of 100 tons per day capacity. The company now has on its dump ready to ship 1000 tons of ore, and intends to produce and ship fifty tons per day during the summer months, and additional hoisting machinery is necessary to take care of the increased output. The company is giving employment to all freighters who make application at the mine, and could use ten or fifteen additional four-horse teams.

COLORADO.

Cripple Creek.

C. O. D. MINE SOLD FOR $600,000.—The C. O. D. mine, in Poverty Gulch, has been sold for the reported sum of $600,000. The sale which has been pending for a short time only, was ratified this week, when $25,000 of the purchase price was deposited in the First National Bank of Cripple Creek in the name of the original owners.

The check was signed by H. R. Lounsberry of New York, who conducted the purchase, and who is supposed to be acting for a party of New York men and also largely for himself.

The C. O. D. mine was the property of Troy, Burke, Sutt and Penrose. Ten days ago, they say, they gave an option on the mine for ten days at $600,000. They now declare they had no idea it would be taken up in that short period of time, and therefore made no preparations for turning the property over to the new owners. The option expired, and in accordance with its terms the $25,000 was paid in the bank and the final papers signed. All the money is to be paid by July 1st.

IDAHO.

PLACER MINES SOLD.—Caldwell *Tribune:* F. Stounenberg has sold to E. T. Staples, of Payette, a half interest in the Colorado Bar

and Big Bar placer mines; consideration, $2,000 each. The mines are situated on Middle Boise river, 100 miles east of Caldwell.

A VERY BIG STATEMENT.—Lemhi *Republic:* A very rich strike is reported from the Yellow Jacket by the Columbia Company. A 700,000-ton body of ore has been uncovered on the Cleveland and Estevan claims. It is free milling and will yield in the neighborhood of $12 a ton.

THE BUNKER HILL AND SULLIVAN.—At a meeting of the Bunker Hill and Sullivan Company, at which several large stockholders were present, recently held at the office of the company, it was decided, in view of the present situation, to further curtail expenses, and that the company would not consider the subject of starting up at all for the present, nor until such time as they received full assurance that when they do, the community will allow them to manage their own business, according to the company's own best judgment. The company further resolved to pursue the policy it has always followed, of not making any compromise with any association whatever, in order to be able to run the mine. When they do start up they intend to take care of their friends and those who have stood by them heretofore, giving them, all conditions being equal, preference over those that have in the past tried to interfere in the management of the company's own private affairs. The company for some time past has been looking into the matter of installing sinking machinery, and also machinery for recovering part of the mineral that at present goes into the tailings. As the installation of all this machinery involves an expenditure of a large amount of money, the whole matter will be held in abeyance until the company is assured by the community that it can manage its own affairs and run the mine in its own way for a period of at least three years. To sum up, the company will not go to the expense of starting up until it is absolutely certain that the community will hereafter not interfere with the maangement of the company's business, nor drive out of town American citizens who may desire to work for the company.

The following proposition is being circulated for signatures:

"We, the undersigned, citizens of Wardner and Kellogg, in consideration of the extremely low prices of lead and silver now ruling, and in further consideration of the fact that the cost of living has decreased, believe that while these low prices continue, $3 per day for miners and $2.50 per day for laborers, are fair and just rates of wages. We further believe that the Bunker Hill and Sullivan Mining & Concentrating Company has the same right to manage its own affairs as we have to manage ours; and we hereby pledge the company our cordial support in its determination to pay no higher wages while the prices of lead and silver are so low."

THE BUNKER HILL'S OFFER.—Twenty-five of the business men of Wardner and Kellogg called on Mr. Corning and Mr. Bradley of the Bunker Hill and Sullivan office, Sunday evening, March 31, to consider the question of starting the mine. On being asked under what circumstances they would start, Mr. Corning replied: "We will start the mine providing the citizens of Wardner will stand by us. We ask no man to shoulder a gun, and we will pay $2.50 and $3 for labor, and as soon as lead and silver advance we will pay more. Furthermore, we want it plainly understood that we will not recognize any labor organization whatever."

A BIG PROPOSITION.—*Review:* An immense vein of rich galena ore was recently uncovered in the Helena and Frisco mines in the Coeur d'Alene country. The property is owned by S. T. Hauser, A. M. Holter, John T. Murphy, A. J. Seligman, Peter Larsen, A. M. Esler, H. Barbour and E. W. Knight. These gentlemen have invested about $1,000,000 and have taken out about $1,500,000 in cool cash. The find is reported to be the greatest ever made in a galena property, and was at first doubted by the Helena owners. The new ore body was encountered in a drift eighty feet from the 100-foot level, where a body of solid ore sixty feet wide was exposed in a crossent. The pay streak as shown in the shaft and drift from the surface extends 800 feet along the vein, as demonstrated in prospecting shafts.

A full equipment of the most modern machinery has been ordered for the mine, all of which will cost in the neighborhood of $40,000. The equipment includes a compressor, which will be the largest in America, running as it will between forty and forty-five drills. This machinery will be in position and full operation on or about August 1. When the new machinery is in and the mine being worked to the full capacity of the mill the profits will amount to over $25,000 per month.

MONTANA.

THE GOLDEN SUNLIGHT MINES.—*Review:* The American Development and Mining Company have taken full charge of the Golden Sunlight group of mines near Whitehall, and intend working it on a larger scale than ever before. The closing down of this property two weeks ago by the New York company threw quite a shadow of disparagement over the Whitehall district and for a while the situation looked quite dubious. Bernard McDonald, president of the A. D. and M. Company, went over there last week and took charge of the property after the New York syndicate had thrown up their bond and lease. Everything on the premises, including machinery, buildings and railroad improvements, reverted back to the original owner. The New York company had the property bonded for $500,000, upon which they had paid $165,000, with the fourth payment due in April. This they forfeited when due, and no time would be given them on an extension.

The American Development and Mining Company will now go ahead with the work themselves with James H. Henley, formerly superintendent at the Granite Mountain mines, as the manager of the property and one of its trustees.

OREGON.

BAKER.

RICH STRIKE AT THE VIRTUE.—*Democrat:* There was another rich strike made at the Virtue mine yesterday and from all reports it is the most extensive gold deposit unearthed in this section for a long time.

Persons who were at the mine yesterday and who came to town report that during the time they were at the mine the miners were coming up from the shaft with candle boxes filled with gold, seemed with quartz.

The new find was uncovered in the crosscut tunnel from the 300 foot level, it is certain that the $20,000 monthly output with twenty stamps will be considerably increased from this time on.

UTAH.

A NEW PROCESS.—*Tribune:* William Kelly, of Ophir, has discovered a process for treating gold, silver and lead ores, which saves ninety-five per cent of the values, at a cost, he claims, of $2.50 per ton.

WYOMING.

A GOOD MINE.—Bart Bissaca, of Beulah, is said to be the owner of a gold mine that shows $780 to the ton in gold, with a good body of such ore in sight.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from David Croft, in the Gold Deposit mine, near Kelsey, El Dorado Co., to deposit tailings in an old hydraulic pit; from Wm. F. Coe, in the Railroad Placer Mine, near Placerville, El Dorado Co., to deposit tailings behind dams in Spanish Flat Ravine; from J. C. Day, in his mine near Georgetown, El Dorado Co., to impound tailings in an old hydraulic pit; from John A. Bowles, in the Independence Mine, near Brownsville, Yuba Co., to impound tailings behind a dam in Letson Ravine; from Wm. Henning et al, in the Iowa Mine, near Forest Hill, Placer Co., to impound tailings behind a dam in a ravine; from Jas. Ward & Wm. McDonald, in the Tiger Mine, near Forest Hill, Placer Co., to impound tailings behind a dam in a ravine; from Jos. J. Hoffman et al, in the Hard Times Mine, Bath, Placer Co., to impound tailings in an old hydraulic pit; and from Wm. & Wm. J. S. Bacchi, in the El Dorado Placer Mine, Garden Valley, El Dorado Co., to impound tailings in ravine below the mine, gives notice that a meeting will be held at Room 92, Flood Building, San Francisco, on April 22d, 1895, at 1:30 P.M.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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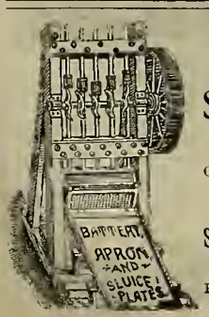

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Electrical Progress.

Large Guns as Magnets.

Some months ago the PRESS published an interesting account of an unusually large magnet constructed of two fifteen-inch guns at Willets Point, N. Y. The subject has attracted considerable attention. In the current number of *Cassier's Magazine* is an article with the above captiou, written by Lieut. King, in which he says:

The idea of constructing a huge "gnn magnet" was suggested to the writer some twenty years ago by seeing two fifteen-inch guns lying side by side at the United States Engineer School at Willets, New York; but as there was then no snitable insulated wire at haud, and as no means were available for generating a powerful electric current, nothing was attempted at that time. In 1888, however, the accumulation of several miles of condemned torpedo cable and the presence of some large dynamos brought the subject forward in a still more suggestive and practicable form, and the experiment was tried.

The guns, weighing 50,000 pounds each, were placed side by side and connected at the breech by a pile of railway bars. Coils of insulated wire, some eight miles iu all, were placed around the muzzles of the gnns, and an armature, 7½x11½ inches in cross section, was made of wrought-iron plates bolted together.

When the current was turned on, it was not only found that a magnetic field of unprecedented inteusity was formed, but an exceptional opportunity was presented for studyiug the pheuomena of electro-magnetism. The lines of force could be traced to a great distance. A pnll of 20,600 pounds was required to detach the armature, and four 320-pound projectiles were suspended like a string of beads from one of the guns.

In more recent experiments with a single gun, wrapped with about ten miles of wire, and having the maguetic circuit completed by a pile of heavy iron plates, the pull required to detach the armatnre was 44,800 pounds, and five of the projectiles were supported from the muzzle. It is, perhaps, needless to say that the extravagant statements recently circulated about this magnet are without foundation. It was never intended "to derange ships' compasses" at *any* distance, and it certainly could not do so at a range of "six miles," nor could it pull vessels out of the water or arms out of the hands of soldiers. Such statements would refute themselves if it were not for the fact that electricity has, for several years past, been doing such unexpected things that even scientific men hardly dare to say that anything claimed for it is impossible.

In this utilitariau age the first question asked is, "What is a thing good for?" and, in this case, the answer is, "To study electro-magnetism on a much larger scale than has hitherto been attempted." It is well known that all physical laws can be better understood by studyiug extreme cases as well as intermediate ones, and in this iustance several results have been observed that have escaped uotice in ordinary experiments.

At a distance of about seventy-oue feet the field of this magnet is equal to the earth's field, or, in other words, it will deflect the needle 45° at that distauce. At a distance of 200 feet the deflection is 3°. At about 7½ inches from the muzzle of the gun there is a neutral point at which a small piece of iron is neither attracted nor repelled. If placed nearer the gnu, but in its axis, it will be thrown out with some little force, sometimes as much as two feet, and then drawn back obliquely to the side of the muzzle. No perceptible effect can be detected on the nerves or muscles of the human system, although the lines of force sent through the head or heart are strong enough to cause iron bars, spikes, etc., to stand ont like the quills of a porcupine.

Theoretically, such a stroug magnetic field should check or "damp" the vibratious of metallic strings; but iu the few experiments tried, no such effect was perceptible. Three strings of a sonometer, one each of iron, brass and twine, were all tuned to "b flat," but when sounded together in the magnetic field, close to the muzzle of the gun, they were still in unison as nearly as could be detected. Neither was there any perceptible effect on light. For the purposc of testing this a transit was set about thirty feet from the magnet and sighted, at a well-defined mark several hundred feet beyond it, the line of sight passing only a few inches from the magnet. When the current was turned on, no chauge whatever was observable in the appearance of the object. In other words, the rays of light were not bent.

These last three results are of a negative character, but they are conclusive as far as they go. In these experiments there were about 5250 tnrns of wire around the gun, which, with a current of about twenty-one amperes, gave over 110,000 "ampere turns." The cross section of the cast-iron core varied from 300 square inches at the muzzle to about 1500 square inches at the largest place. The length of the gun is about sixteen feet, and the coils of wire cover about one-half the length.

A Tremendous Light.

The idea of an electric light which, fed by a current from a dynamo actuated by a forty-horse power engine, and giving 7,000-candle power can have its illuminating power intensified 35,000 times, is not easy to grasp. It means the production of a stream of light of about 250,000,000-candle power, aud it is no wonder that the announcement that snch a light is about to be used in this country has been received with some incredulity in Europe. This is the efficieucy of the light which will be shortly erected at Fire Island for the illumination of the adjacent coast and the protection of the fleet of ships eutering New York Harbor. A remote suggestion of the power of this lamp may be arrived at by bearing in mind that an ordinary oil lamp is about thirty-eight or forty-candle power, and then trying to imagine the combined beam of 3,000,000 lamps. The ordinary electric street light may be put down at 100-candle power. and 250,000 of these would about represent the strength of the Fire Island light.

The most powerful oil lamp yet made is supposed to shine ont on a clear night for a distance of thirty-five or forty miles, but the new light will flash its welcome rays to the coming European liners when they are 120 miles away. The light revolves rapidly and throws out its beams with the inteusity the speed of lightning. The motive power which actuates it is a simple clock-work arrangement contained in a box two feet square, and although the revolving portion of the light weighs fifteen tons, the mechanism controlling it is so delicate that the pressure of two fingers will turn it. The value of this marvelous lamp can only be determined by practical working, but it promises to represent an immense stride in the science of coast lighthouse illumination.

IN CHICAGO the mails are now sent from the postoffice to the Illinois Ceutral depot by electricaily propelled cars, rnnuiug over the roofs on a three-eighths-inch steel cable carried by iron brackets on posts. The little aluminium cars carry seventy-five pounds each. The current is transmitted by a trolley running on a wire parallel to the cable.

THE result upon prices of the reduced consumptiou of metal is illustrated that a recent electric lighting scheme in Londou has been carried out at a saving on the estimate on copper alone of £6000.

METAL MINING

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Office of THE CLEVELAND IRON ORE PAINT CO. and THE GARRY IRON ROOFING CO., CLEVELAND, O., Jan. 25, 1894.
The American Mining & Milling Machinery Co., Cleveland, O.:
GENTLEMEN:—We purchased a No. 2 American Rock Breaker and a No. 2 American Ball Pulverizer from your company about one year ago. The latter part of April, 1893, we started up for regular work, since which time we have run both of said machines to the full extent of our demands and to our entire satisfaction. The first 700 tons of hard iron ore that we pulverized for paint purposes was ground without taking the Pulverizer apart, and without expending one dollar for repairs for either of these machines. Of the 700 tons spoken of, about 200 tons was Lake Superior Specular iron ore, containing some 70 per cent iron; a very difficult ore to pulverize. The remainder was a red fossiliferous iron ore, carrying quite a per cent of silex, which cuts out buhr-stones rapidly. We find that the steel balls, which were when new 5 in. in diameter, now caliper 4⅞ in., and are perfectly round and smooth. The grinding track shows very little wear, and the driving track shows LESS; in fact, the wear is almost imperceptible. These two machines crush and pulverize more than one ton per hour with LESS than 12 H. P. We do not know of any Crusher or Pulverizer that can compare with the output of these two machines in quantity, quality, small amount of wear and tear, and like power. In our opinion, you cannot recommend them too highly. Very truly yours,
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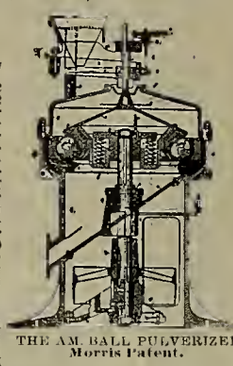
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The Columbian Exposition Medals.

Exhibitors at the Columbian World's Fair in 1893 are growing tired of waiting for the promised medals and diplomas. Information given out quite recently assures the public that the Bureau of Awards is alive, though moving slowly, and that there is good reason to believe the awards will be distributed before the close of 1895.

The Director of the Mint says the medals will be ready for distribution about June 1st. The superintendent of the Bureau of Engraving and Printing says the diplomas are about finished. Though the diploma holds the spirit and letter of the award, the medal is the symbol, and the two must go together. Therefore, allowing a small margin of time, which it is always safe to allow the Bureau of Awards, the sending out of medals and diplomas will hardly begin before July. But it is encouraging, after all the bother and delay over the design, to know that the medals are really under way—up in Connecticut, where artistic work has a wide range, from a wooden nutmeg to a Waterbury watch. In fact, it is a Waterbury firm that is turning out the medals, according to contract let by the Secretary of the Treasury—not to the highest bidder, but to this particular firm, which is to furnish 23,700 bronze medals for $30,000. If, however, any exhibitor should prefer a gold medal, he is authorized by the Congress of the United States to have one, providing he pays for the gold himself. Otherwise all the medals will be of bronze, also authorized by Congress, and perfectly alike, except in the names of exhibitors inscribed on them.

De Lamar in California.

Not content with big mines in Nevada, Colorado and other places on this side of the Sierras, it seems that Mr. J. R. De Lamar now desires to try his luck in California. He wants to get hold of a big property in that State. He does not care for a small vein. If he can find something really "big," he is ready to expend a large amount of money for its development. He will probably be able to find what he wants in the "Golden State," as in numerous places over there are to be found "propositions" so big that no man has yet put in an appearance who was possessed of sufficient "sand" and coin to tackle them. Particularly is this true of gravel deposits and mountain drift diggings, but one may also find undeveloped auriferous quartz lodes of mammoth dimensions. In almost every section of California are to be found miners who for years have been holding on to quartz and gravel claims so big that they are themselves unable to do anything with them. Men of means and mining knowledge need not go to South Africa or West Australia in order to find some big thing to tackle. There are here at home, in the midst of civilization and within easy reach of all necessary supplies, plenty of undeveloped mines. And much in regard to the nature and richness of these mines may be judged from what is to be seen in the producing mines already opened in the same gold belt.—Dan De Quille, in Salt Lake Tribune.

Metal as a Building Material.

It is well within the memory of many persons when metal as a building material was practically unknown. But within a few years building has been almost revolutionized by the use of metal in various forms and for various purposes. Iron beams, columns, girders, rafters and window sashes have come into use, and now we are to have as a regular addition to our list a great variety of stamped-out sections. These have heretofore been made mostly out of galvanized iron or some composition of the spelter sort, or, in fine and high-priced work, bronze has been employed. Steel is, however, found to answer all demands far better than any other metal used for this purpose. Door and window casings will be made of metal, and, indeed, almost all parts of a house may be constructed of something besides wood. With paper-pulp doors and floors, metal frames and finish, slate or tin roof, and Portland cement or concrete walls, our houses may in time come to be actually fireproof, as they have for a long time unjustly claimed to be.

Luminous Paint.

The formula for luminous paint, about which so much has been said, is as follows: Take oyster shells and clean them with warm water; put them into the fire for half an hour; at the end of that time take them out and let them cool. When quite cold pound them fine and take away any gray parts, as they are of no use. Put the powder into a crucible, in alternate layers, with flour of sulphur. Put on the lid and cement with sand made into a stiff paste with beer. When dry, put into the fire and bake for an hour.

Wait until quite cold before opening the lid. The product ought to be white. You must separate all gray parts, as they are not luminous. Make a sifter in the following manner: Take a pot, put a piece of very fine muslin very loosely across it; tie around with a string; put the powder into the top and rake about until only the coarse powder remains; open the pot and you will find a very fine powder; mix it into a thin paint with gum water, as two thin applications are better than one thick one.

This will give a paint that will remain luminous far into the night, provided it is exposed to the light during the day.

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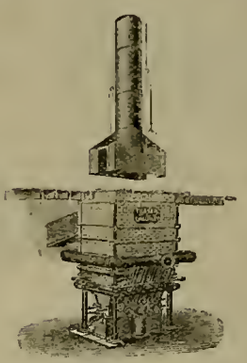

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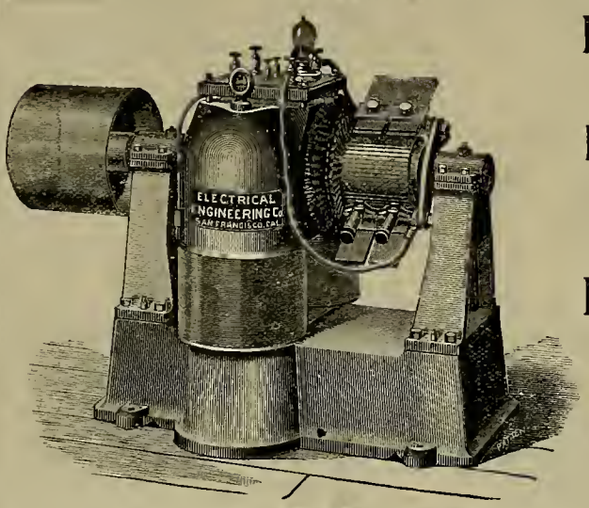

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Market Reports.

The Markets.

SAN FRANCISCO, April 18, 1895.

The news of peace between China and Japan is secondary to the world-wide attention given the silver question and its immediate relations thereto. Among other terms of peace are the payment by China to Japan of 200,000,000 taels. It is to be borne in mind that a "tael" is not a coin, but a weigbt. The Chinese currency system is based upon a certain weight of silver, and not upon the number of a standard coin. Thus, although the currency consists of "cbopped" Mexican dollars, *i. e.*, Mexican dollars defaced by the mark of, say, a blunt nail, yet $1000 Hongkong currency does not consist of 1000 of these defaced dollars, but of 717 taels' weight of them. If the coins are new, 1000 by count weigh about 72½ taels; thus 717 taels' weight would consist of only about 995 pieces. The tael equals 579.84 English troy grains. Any one presenting a check or note for $10,000 at a bank, and wishing to receive coin, would have weighed out to him 7170 taels weight of chopped dollars, and would receive, more or less, 9950 pieces. This system is not so inconvenient as it seems. Europeans, in their small private transactions, by means of notes, checks and small change, manage to avoid altogether the weight system. The 200,000,000 taels indemnity represent about $290,000,000 in Mexican silver dollars. Though not directly and definitely stated, it is generally assumed that the indemnity will be paid in silver. The extreme probability of this has doubtless been the cause of the recent advance of 13 per cent in the price of silver. That such temporary demand would only cause a temporary appreciation in the price is evident; but it is believed that tbere is to be a steady development of Chinese industrial enterprise, a greater inflow of silver to the Orient and a permanent steadiness in silver quotations at a price beyond present quotations. Silver may go to 70 and hover there before mounting higber, but that its upward flight has only begun is asserted by many who claim that the present discussion between men of all parties and no party at all will assuredly result in a renewed apotheosis of the white metal.

This question of a "market for silver" has been wrongfully assumed to be like the tariff —a sort of protected industry discussion—and that salvation lay in "sound," i. e. gold, currency, tbe matter being of greatest interest to a few scattered silver producers in the west half of America. The bulk of the American people are finding out that they have more real interest in the matter than "the silver baron" or the miner on the mountain side, and that, like the man in the wagon drawn by the runaway team, he "can ride as fast as tbey can run." The country needs silver coinage, and the prosperity or poverty of the men who produce the silver is only a small factor in the main problem—national life.

New York Metal Market.

NEW YORK, April 18.—PIG IRON—Scotch, 19@20c; American, 9.50@12.50e.
COPPER—Brokers', 9.37½c; exchange, 9.40c.
LEAD—Brokers', $3.05; exchange, $3.12½.
TIN—Straits, 14.20c.
SPELTER—Domestic, $3.20.

New York Silver Prices.

NEW YORK, April 18.—Following are tbe closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	30⅜	66½	9 40	
Saturday	30⅜	66⅜	9 35	3 12½
Monday	30⅜	67¼	.....	.....
Tuesday	30½	67⅜	.....	.....
Wednesday	30⅞	67½	9 37½	3 12½
Thursday	30⅞	67¾	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	7½c
New York Telegraphic Transfer	10c
London Bankers' 60 days	$4.83¾
London Merchants	$4.86
London Sight Bankers	$4.90
Refined Silver, per ounce	67¾c
Mexican Dollars, nominal	54@54½

San Francisco Metal and Coal Market.

ANTIMONY.

Per lb	—	@	10

BORAX.

Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5

COPPER.

Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14

TIN PLATE.

Per bx	5 25	@	6 00

IRON.

American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00

STEEL.

English, lb	14	@	16

LEAD.

Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "			1 45
Buck, Balls and Chilled, do. "			1 45

QUICKSILVER.

Home trade, per flask	37 00	@	— —

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00
Greta	7 75
Nanaimo	6 50
Gilman	6 00
Seattle	6 25
Coos Bay	6 00
Cannel	10 50
Egg, hard	13 00
Wallsend	7 50
Scotch Splint	7 75
Brymbo	7 75
West Hartley	8 75

TO ARRIVE—PER TON.

Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Spliut	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	11 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —

Mining Share Market.

SAN FRANCISCO, April 18, 1895.

Lower prices prevailed in the early part of the week, and all business was done on a declining scale, the result of continued lack of interest on the part of the former purchasing public. Permanent advance in the price of silver would help out a present weak and wobbly market.

The following illustrates the changes of the week:

MINES.	11	18
	$ 10	$ 09
Alpha		
Alta Consolidated		
Andes	38	
Belcher	65	73
Best & Belcher	86	88
Bodie		1 35
Bullion	22	
Challenge	44	47
Chollar	56	51
Confidence		
Consolidated California and Virginia	2 85	3 00
Consolidated New York		
Crown Point	38	
Exchequer		
Gould & Curry		51
Hale & Norcross	1 35	1 30
Justice		
Mexican	85	88
Ophir	1 70	1 70
Overman	14	13
Potosi	54	52
Savage	38	36
Sierra Nevada	84	86
Union	54	56
Utah		
Yellow Jacket	55	49

San Francisco Stock Board Sales.

SAN FRANCISCO, April 18, 1895.

9:30 A. M. SESSION.

400 Alpha	09	200 Occidental	12
500 Belcher	73	1700	11
100 Best & Belcher	88	200 Ophir	1 70
150 Bodie	1 35	200 Overman	13
300 Bulwer	13	100	12
100 Caledonia	10	100 Potosi	52
500 Chollar	51	100 Savage	36
300 Con Cal & Va	3 00	100 Seg Belcher	21
200 Crown Point	69	100 Sierra Nevada	86
300 E. B. & B.	12	200 Silver Hill	04
100 Gould & Curry	51	100 Union	56
300 H & N	1 30	200 Yellow Jacket	49
200 Mexican	88		

SECOND SESSION—2:30 P. M.

200 Belcher	69	200 Mono	20
200 Best & Belcher	83	300 Occidental	12
200 Bodie	1 15	750	11
200 Bulwer	11	20 Ophir	1 65
100 Caledonia	08	50	1 60
100 Challenge	47	200 Savage	35
200 Chollar	50	50 Seg Belcher	19
200 C. C. V.	2 90	100 S. King	10
200 E. B. & B.	12	150 Sierra Nevada	83
50 Hale & Norcross	1 20	100 Union	53
300 Mexican	83	450 Yellow Jacket	46

Notices of Recent Patents.

Among the patents recently obtained tbrough Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

PARASOL AND FAN.—Mathias Stocklmeier, Los Gatos, Cal. No. 536,707. Dated April 2, 1895. One-half assigned to Charles A. Bronaugh, of the same place. This invention is designed to provide an article which may be converted into an ordinary parasol, standing at right angles with the handle, or a carriage parasol where it lies parallel with the handle, or a fan, or it may be folded entirely into such small compass as to be carried in the pocket or handbag. It consists of a series of elastic ribs having the outer covering fastened thereto, and a pin passing through the meeting ends of these ribs, forming a common center about which the ribs are allowed to turn so that they may all be folded up at one side or opened out to form a complete circle, the material of the covering being separated adjacent to one of the ribs, and the two ribs which come together having a fastening by which they may be locked so as to form a complete parasol. Tbe handle is jointed near the top, so that it may be turned by moving a sliding catch to allow the parasol to lie sideways along the handle, and thus adapting it for carriage use. If it is desired to use it as a fan, the two adjacent ribs may be disconnected and the device closed up to one-half of the circle lying along the side of the handle, and making a convenient fan. The handle telescopes so that it may be lengthened or closed as desired, and when the article is to be packed, all the ribs may be closed alongside the handle and the handle reduced to its shortest length. The device forms an exceedingly convenieut article for ladies' use.

CONNECTION FOR FLUSHING DRAIN-PIPES OF SINKS, WASHBASINS, ETC.—Fred. B. Vinter, San Jose, Cal. No. 536,769. Dated April 2, 1895. The object of this invention is to provide a simple and readily adjustable means for connecting a flushing or forcing pump with the drain or tbe waste pipe, wbereby the latter may be cleansed or opened out when clogged, in an easy, thorough and effective manner, the work being done by one man instead of two ordinarily employed. The device consists of a plate or base adapted to fit within tbe vessel directly over the mouth of the drain or waste pipe, said plate or base having an internally threaded opening, and a washer or gasket under it to form a tigbt joint; means for securing and tightening the plate or base to its seat, and an internally threaded nipple fitted to the base and adapted to be screwed to the internally tbreaded opening therecf for the attachment of tbe hose of a force pump.

CONNECTION FOR FLUSHING DRAIN-PIPES OF SINKS, WASABASINS, ETC.—Fred. B. Vinter, San Jose, Cal. No. 536,770. Dated April 2, 1895. This invention has the same object as the preceding one, and it consists of a different means of securing the parts in place, namely, a nipple passing througb the central aperture of the plate or base, and having catch lugs on its lower end adapted to engage the cross-bars of the strainer.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDINO APRIL 9, 1895.

537,037.—TUBE TESTER—T. W. Heintzelman, Sacramento, Cal.
537,038.—SAFETY VALVE—T. W. Heintzelman, Sacramento, Cal.
537,153.—SASH HOLDER—L. A. Heinzerling, Monte Cristo, Wash.
537,294.—GAS BURNER REGULATOR—J. Kraker, S. F.
537,162.—CAN—John Lee, San Mateo, Cal.
537,346.—CONNECTING ROD—F. F. Maag, Beaumont, Cal.
537,056.—HOP PICKER—M. Marsa, North Yakima, Wash.
537,360.—STATION INDICATOR—Murray & Krasky, S. F.
537,313.—PRESERVING FRUIT—A. D. Shepard, S. F.
537,314.—RIVETING MACHINE—J. I. Smith, Chico, Cal.
537,082.—TAPE MEASURE—C. Smart, Turlock, Cal.
537,257.—GOLD SAVING APPARATUS—B. M. Whiting, Spokane, Wash.
24,176.—BADGE DESIGN—C. G. Tingry, Portland, Or.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

WANTED!

$2500—Wanted, a competent and honest quartz mill man, with above sum, to take half interest in custom quartz mill, permanent and desirable.

$5000—Wanted, a competent and honest quartz mill man (assayer preferred) to take interest in a custom quartz mill, chlorination works and a group of developed mines.

Both of these investments are safe and desirable, and invite investigation. For particulars, address

G. B. ROBERTSON, Attorney-at-Law,
YREKA, CAL.

A SPECIAL MEETING of the stockholders of the Julia Consolidated Mining Company will be held at the office of the company, room 56, No. 309 Montgomery street, San Francisco, California, on FRIDAY, the 3d day of May, 1895, at the hour of 1 o'clock, for the purpose of considering what disposition shall be made of stock now in the treasury of and belonging to this company, and the transaction of such other business as may come before the meeting. Transfer books will close on Tuesday, April 30th, at 3 o'clock P. M.
J. STADTFELD JR., Secretary.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Belcher S M Co, Nev	50	25c	Mar 5,	Apr 9, Apr 30	C L Perkins, 309 Montgomery
Brunswick Con G M Co, Cal	8	2c	Mar 20,	Apr 20, May 15	J Stadtfeld Jr, 309 Montgomery
Bullion Con G M Co, Cal	1	10c	Feb 19,	Mar 25, Apr 25	C A Grow, Mills Building
Crown Point G & S M Co, Nev	65	25c	Mar 12,	Apr 16, May 7	Jas. Newlands, Mills Building
Gray Eagle M Co, Cal	39	5c	Mar 2,	Apr 8, Apr 26	A P Swain, 309 Montgomery
Iowa M Co, Nev	20	5c	Mar 6,	Apr 9, Apr 27	R L Thomas, 419 California
La Candelaria M Co, Mex	82	5c	Mar 7,	Apr 9, Apr 27	G A Hill, 22 Market
La Grange H M Co, Cal	10	25c	Feb 23,	Apr 1, Apr 22	A Halsey, 328 Montgomery
Occidental Con M Co, Nev	18	10c	Mar 20,	Apr 23, May 15	A K Durbrow, 309 Montgomery
Ophir S M Co, Nevada	65	25c	April 4,	May 7, May 27	E B Holmes, 50 Nevada Block
Osborn Hill G M Co, Cal	4	25c	Feb 27,	Apr 4, Apr 24	R R Grayson, 331 Pine
Overman, Nev	73	10c	Apr 15,	May 21, Jun 11	Geo D Edwards, 414 California
South Eureka M Co, Cal	17	1c	Feb 20,	Apr 1, Apr 22	A Halsey, 328 Montgomery
Yellow Jacket, Nev	59	25c	Apr 15,	May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETING (SPECIAL).

Company and Location.	Secretary and Office in S. F.	Date.
Julia Consolidated	J Stadtfeld Jr, 309 Montgomery	May 3

Assessment Notices.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Grass Valley Mining District, Nevada County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 20th day of March, 1895, an assessment (No. 8) of Two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, Nevada Block, San Francisco, California, or to the Treasurer, J. J. Halpin, 57 Broadway, room 87, New York City, State of New York, on or before the 20th day of April, 1895.

Any stock upon which this assessment shall remain unpaid in San Francisco, on the 20th day of April, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.
J. STADTFELD JR., Secretary.
Office—Room 56, Nevada Block, San Francisco, California.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 20th day of March, 1895, an assessment (No. 18) of Ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 23d day of April, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 15th day of May, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.
ALFRED K. DURBROW, Secretary.
Office, Room 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

OVERMAN SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of April, 1895, an assessment, No. 73, of ten cents (10c.) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of May, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 11th day of June, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. D. EDWARDS, Secretary.
Office—No. 414 California street, San Francisco, California.

Selby Smelting and Lead Company,

416 Montgomery Street, San Francisco.

Gold and Silver Refinery
—AND—
Assay Office.

HIGHEST PRICES PAID FOR GOLD, SILVER AND LEAD ORES AND SULPHURETS.

Manufacturers of
BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, ETC., ETC.

Also Manufacturers of
STANDARD SHOT-GUN CARTRIDGES,
Under Chamberlin Patent.

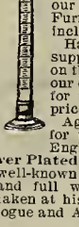
John Taylor & Co.

Importers and Dealers in

Assayers' Materials,
Mine and Mill Supplies.

Also Chemicals, and Physical, School and Chemical Apparatus.

63 & 65 First St., Cor. Mission, San Francisco.



We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

M.C.C° BATTERSEA

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents of the Denver Fire Clay Co. and for the Morgan Crucible Co., Battersea, England. Also for E. G. Denniston's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.
JOHN TAYLOR & CO.

UNION IRON WORKS,
SACRAMENTO.....CALIFORNIA.

ROOT, NEILSON & CO.,

—MANUFACTURERS OF—
STEAM ENGINES, BOILERS,
And all kinds of
MACHINERY FOR MINING PURPOSES.

Flour Mills, Saw Mills and Quartz Mills; Machinery Constructed, Fitted Up and Repaired.
FRONT STREET, Bet. N & O.,
SACRAMENTO, CAL.

Coast Industrial Notes.

In addition to the launches recently built, the Union Gas Engine Co. are building three for Australia.

A large force of men is at work on the Rio Verde, Arizona, canal and storage reservoir. The entire work will cost $2,000,000, and is to be finished in three years.

The Zindorf Construction Company, of Seattle, Wash., has incorporated with $70,000, to construct railways, bridges, etc. The incorporators are M. P., H. I. and M. Zindorf.

The Pelton Water Wheel Co. are sending a 200 H. P. plant to Kioto, Japan, there to be used in operating a street railroad system. They are also building an electric-power plant for Guatemala residents.

The Hayward-Lane mining properties at Silver Bow, Alaska, are having put in place the new mill, etc., recently shipped from the Union Iron Works. Francis Smith & Co. are sending up several thousand feet of iron pipe.

The Union Iron Works has secured the contract for the immense new hoisting plant for the Anaconda, Montana, mine. The Anaconda has everything on a superlative scale and the new machinery will be second to none in that State.

W. E. Lindsay, at his marble works in Antelope valley, Nevada, last week cut out by machinery a block of marble six feet square and eleven feet long. The block contains 396 cubic feet and weighs 80,000 pounds. It is the largest solid block of marble ever cut out by machinery on this coast.

It is stated in Los Angeles papers that Stein Bros., the proprietors of the Monarch Distilling Company of Chicago and Owensboro, Ky., are making arrangements to put in a $1,000,000 plant in that city. President Stein is now there, and has purchased property which is said to be intended as ground for the plant.

The Market Street and Castro Street railway lines were each supplied with a new cable this week: the one for Market Street is 24,650 feet long, one and five-sixteenths inches in diameter, and weighs 72,000 pounds. The Castro Street cable is 22,000 feet in length. From ninety to two hundred and fifty days is the limit of the life of a cable in this city.

The Southern California Railway has one passenger, one freight and two switch engines running burning oil as a fuel successfully. The engine in the passenger service makes 190 miles and averages eighty stops daily. They have several engines which are about completed as oil burners, besides several others well under way which are to burn oil as fuel.

—The Stockton Car, Agricultural and Machine Works is shipping two harvesters to the Argentine Republic, the pioneer harvesters to enter that South American country. Five more of the machines will be constructed and sent to Argentine if these two prove successful, as they probably will. Two experts will be sent with the machines to properly start them to work.

—On the reported cut of the Washington lumber and shingle mills on the 1st inst., it is estimated that the sawmills of that State have an ordinary daily capacity of 7,500,000 feet of lumber, 15,000,000 shingles and 1,500,000 laths. The Tacoma mill made the largest cut: 257,000 feet of lumber and 90,000 laths in twelve hours, employing 210 men. The Port Blakeley mills were second. There are 280 mills in the State, about 250 being in operation.

At the annual meeting of the Canadian Pacific Railway Co., in Montreal, on the 3rd inst., the annual report showed the gross earnings to be $18,752,107, and working expenses $12,328,858, leaving net earnings $6,423,309. To pay interest on land bonds $2,112,729 had been taken from the reserve fund. The earnings per passenger per mile were 1.85 cents, and per ton of freight per mile 0.85 cents, against 1.69 and 0.87 cents in 1893. The Fraser river floods caused a loss of $550,000, and depression in business is responsible for the balance.

The cradle in which the big lumber raft is building at Stella, Wash., by Messrs. Robinson & Baines, is finished. Most of the piles of which the raft is to be constructed will be floated down the Cowlitz river. The steamer Alice Blanchard brought up from this city thirty tons of massive chains that will be used in binding the thousands of piles together, though it will take thirty additional tons of chains to complete the job. To avoid a disaster such as occurred to the raft towed out of the Columbia last fall, the builders are having a strong bulkhead put in each end of the raft. Instead of using a tug, this raft will be towed here by a large ocean steamer. The last raft, which went to pieces off the mouth of the Columbia, contained 10,000 piles, and the raft was over 400 feet in length. The builders and owners of the second raft propose to profit by their costly experiment.

—There is a growing tendency among manufacturers to use crude petroleum in place of coal as fuel. The use of oil is becoming common also in locomotives, and its general adaptability as fuel where coal has before been used renders it by reason of its greater cheapness and ease of handling a success as such an agency. Since the permanency of the oil wells of Los Angeles has been proven the railroads and manufactories of southern California have in many instances made a test of oil as a fuel, with the result that there is already a steady demand upon some of the wells for the entire output. There are at present in the neighborhood of 160 wells in Los Angeles capable of producing 2000 barrels of oil per day. The Santa Fe Company is now running four engines with good success with oil, and will change its entire locomotive equipment to oil-burners, probably within the next four months. The Los Angeles Terminal road is also running two oil-burning locomotives with good results, and has signified his intention of putting on more. The cost has been found to be about one-third as much as coal, and the use of oil is considered an unquestioned success.

—The Golden Cross Mill and Mining Co. are making extensive improvements. They now have forty stamps in operation, and will add sixty, the present number running till the additional sixty, now in process of construction by the Fulton Engineering and Ship-Building Works, are on the ground, where they will be placed back to back in the one building. The new machinery includes a compound Corliss engine, surface condensing. With them, fuel is an important item; the water used is pumped from the Colorado river, twelve miles distant, and piped to the mine from a reservoir. The new stamps are of steel, each 1000 lbs. weight. The Fulton Works are also building three other stamp mills, one of 30 stamps for the Silver Peak, Nevada, mine, another 30-stamp for the Whitlock, Mariposa Co., and a 10-stamp mill to be sent to Helena, Montana. They are also putting up a 100-ton refrigerating machine for Myer and Zobleman, brewers of Los Angeles.

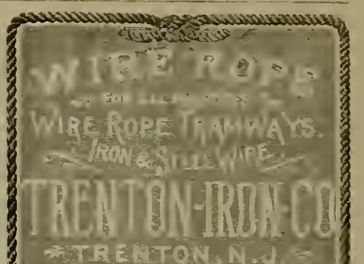
—The Durango, Flagstaff and San Diego railroad would cost, it is figured, $7,000,000, the following being the estimate of average cost per mile of single-track railroad:

Civil engineering and supervising	$ 110
Ten-foot cuts and fills	242
Track and tieing, laid	4,000
Bridging	317
Tunneling	15
Masonry	500
Piling	10
Rock cutting	400
Sidings	113
Telegraph	100
Buildings	500
Snow sheds, fences and plows	92
Total for tracks	$6,389
Total for equipment	2,000
Total for tracks and equipment	$8,389
Right of way, average	100
Total average cost per mile	$8,489

The contractors would do well, however, to double those estimates.

—The laying of a submarine cable between the United States and the Hawaiian Islands will be one of the vital questions to come before the 54th Congress. The recent refusal of the present House of Representatives to agree to the appropriation of $500,000 for the important enterprise was unfortunate. It is more than likely, however, that the next House will be more favorable to the enterprise, and the Senate will be as well disposed, at least, as the present body. But the President is understood to be opposed to any Government aid being granted the scheme, and consequently the probabilities are that no encouragement will be forthcoming during the present administration. Public sentiment may, however, become so strongly in favor of the enterprise that a two-thirds vote in both branches of Congress will be obtained to override a veto. That the enterprise is an important one and sure to be carried out in the near future is certain. The only question now is whether the project shall be hastened by the granting of governmental assistance, or whether it shall wait for the slower movement of private capital. It is estimated that the cost of a cable from this country to Hawaii would be $3,000,000. From Salinas Landing, in Monterey bay, to Honolulu is 2107 miles, and as the expense of making and laying a cable is placed at $1200 a mile, these two items would amount to $2,528,400. Allowing $471,600 for equipment, concessions and franchise, and the total cost would be $3,000,000. The British and Canadian Governments are willing to spend $7,000,000 in a Pacific cable. Why, therefore, is it unreasonable or bad policy for the United States to spend less than half that sum in establishing telegraphic communication with the key of the Pacific ocean?

—Most of the cross-ties on the coast lines of the Southern Pacific railroad are redwood. Some of the ties are made from pine and fir, treated with creosote or chloride of zinc to make it durable. As the supply of timber comes from widely separated points, and it is expensive bringing it to a central station to be treated with these preservatives, and then sending it to another place to be laid in the track, it was recently decided to make a portable apparatus which could be moved from place to place, thus reducing the expense of the preserving process by an amount equal to the saving of transportation effected. The apparatus consists of a train made up of a car equipped with two steam boilers, steam winch and other appliances; a car provided with a superheater, pumps and tanks; two cars, each carrying three wooden tanks for holding the preservative liquid, and two retorts, each six feet in diameter and 114 feet long, divided into two sections, each carried on two heavy car trucks. This train is hauled to a location such that the cost of moving the rough ties to it and the treated ties from it is reduced to a minimum. Then the retorts are connected with the other apparatus; the tracks are arranged so that the ties can be hauled in and out of the retorts by wire ropes, and the side tracks are laid so that the labor of handling the ties is as little as possible. The method of treatment with zinc chloride is comparatively simple. The charge of ties is run on metal trucks into the retort, and the heads or doors of the latter are bolted up. Next a preliminary vacuum is produced in the retort. It takes about ten minutes to produce this vacuum, and meanwhile the doors are bolted up tight. Live steam at about thirty pounds pressure is then let in, and is continued for about four hours and a half, about half an hour more being required to blow it off. During this steaming and blowing off the retorts are drained. For about an hour longer a second vacuum is maintained, and then the tank is filled with the solution of zinc chloride and put under pressure, which is maintained until the required amount of the solution has been absorbed. Finally the surplus fluid is drawn off, the doors opened and the charge hauled out. Another charge has been made ready in the meantime, and is immediately pulled into the same retort to undergo the same process. The total time of treatment averages about eight hours and a half, and the entire plant is capable of treating about 2500 ties in 24 hours. If the timber is to be creosoted the same plant is used, but the method of operation is different. The ties are first boiled in dead oil, and, after being dried, are then filled with the creosote by applying pressure. No vacuum is used, but the vapors given off during boiling are passed through a surface condenser, the outlet of the latter being left open to the air. The condenser enables the sap extracted to be measured, and also affords a means of recovering the lighter portions of the creosote carried over with the vaporized sap.



PUMPS!

SEALED PROPOSALS

Will be received by the CITY OF SACRAMENTO, CALIFORNIA, until MAY 1, 1895, for furnishing and constructing

HIGH DUTY PUMPING ENGINES

One (1) having a capacity of 5,000,000 gallons per twenty-four hours; the pump to be of the vertical triple expansion or cross-compound type.

The bid to include air pumps, valves, feed pumps, piping and all other appurtenances pertaining to a pumping plant, excepting boilers.

Steam-pipe connections must be made and furnished by contractor, also connections made and furnished to suction and mains.

The city to furnish concrete foundation for pump and build pump house.

Specifications may be obtained at the office of the City Clerk.

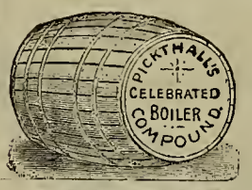
O. S. FLINT, City Clerk.

HEALD'S
Business College,
24 Post Street, - San Francisco.
FOR SEVENTY-FIVE DOLLARS
This College instructs in Shorthand, Type-Writing, Bookkeeping, Telegraphy, Penmanship, Drawing, all the English branches, and everything pertaining to business, for full six months. We have sixteen teachers and give individual instruction to all our pupils.
A Department of Electrical Engineering
Has been established under a thoroughly qualified instructor. The course is thoroughly practical. Send for Circular. G. S. HALEY, Sec.

QUICKSILVER!
—FOR SALE BY—
The Eureka Company,
OF SAN FRANCISCO.
ROOM 1. - 426 CALIFORNIA STREET,
SAN FRANCISCO.

TUBBS CORDAGE CO.
(A CORPORATION.)
Constantly on hand a full assortment of Manila Rope, Sisal Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc. Extra sizes and lengths made to order on short notice
611 and 613 FRONT ST., San Francisco, Cal.

The Russell Process.
For information concerning this process for the reduction of ores containing precious metals, and terms of license, apply to
THE RUSSELL PROCESS CO.,
Park City, Utah.



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Celebrated Boiler Compound
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Removing or Preventing Scale, Corrosion and Pitting in Steam Boilers.
Will save its cost in fuel, boiler repairs or labor.

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For Hot or Cold Water.
Pure Rubber Air Pump Valves.
COMBINED RING PACKING
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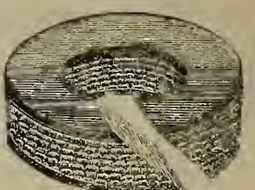
—AND ALL—
ENGINEERS' SUPPLIES.

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509-513 MISSION STREET.....SAN FRANCISCO, CAL.
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PRODUCES A MORE PERFECT CUBIFORM MATERIAL AND A GREATER QUANTITY IN A GIVEN TIME PER HORSE POWER USED THAN ANY OTHER CRUSHER ON EARTH.
CAPACITIES UP TO 150 TONS PER HOUR. NINE DIFFERENT SIZES.
WE HAVE BUILT THE LARGEST STONE CRUSHING PLANTS IN EXISTENCE
GENERAL MINING MACHINERY
OF EVERY DESCRIPTION.
TREMAIN STEAM STAMPS
Connorsville Blowers, King-Darragh Concentrators, Stamps, Hoists, Rolls, Pans, Settlers, Smelters, Metallurgical Appliances, Etc.
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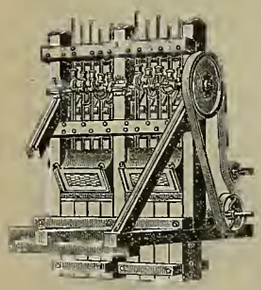

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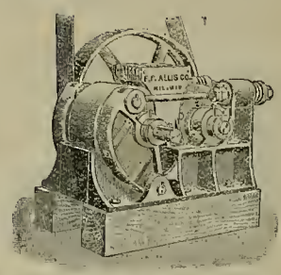

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VOLUME LXX. Number 17. SAN FRANCISCO, SATURDAY, APRIL 27, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

The Girard Water Wheel Company.

Among other present matters of local industry in this city is to be noted that of making Girard impulse water wheels, a branch of much importance from several points of view.

Americans, contrary to custom and tradition, have, almost without notice or participation, permitted the rise and development of impulse turbine wheels to go on increasing for forty years past in nearly all the countries of Europe, the only exception, and a very important one, being the development and manufacture of tangential wheels on this coast.

The impulse turbine was invented in this country long prior to its rise in Europe, but the inventor, in presenting his petition for a patent in the United States Patent Office in 1853 for an unfilled or impulse turbine water wheel, was informed that he had no standing in hydraulic practice, and his views were fallacious. The fact of his having constructed such wheels, and operated them under high efficiency, was not regarded as good evidence; but twenty years after, when Girard and others had demonstrated the value of the method, and firms in Europe were making and supplying such wheels, a patent was issued to Jearum Atkin, still living in Philadelphia, Pa.

The Fourneyron and Jonval wheels were introduced from France, and the American inward discharge turbines came up in many ingenious forms, but no wheels operating on the impulse system, except tangential wheels in California, and when the Niagara Commission came to consider water wheels for a head of 140 feet there were no plans furnished from this country that met with any consideration by the commission of engineers appointed for that purpose except the tender for tangential wheels prepared by the Pelton Water Wheel Co. of this city.

The reason of this is found in the fact that all over the Eastern slope, from the Rocky mountains to the Atlantic coast, and throughout the Mississippi valley, where so large a proportion of our national industries and population are situated, the streams are flat and the heads are low. Where this is not the case the volume of water is usually great, and the head is divided, in some cases, into three parts, so that turbine practice has all centered in the pressure or low-head type now made by not less than twenty firms and companies in this country.

The Girard or impulse water wheels, so called because M. Girard, of Paris, was most prominent in developing, explaining and designing such wheels, came to the front about 1860, being first made, but on plans now abandoned, at Zurich, in Switzerland, where, as on this coast, the high heads and pressures rendered the common turbine wheels impracticable.

Girard or impulse water wheels as distinguished from pressure turbines, and even from tangential or other impulse wheels, have peculiar features. They are capable

(Continued on page 262.)

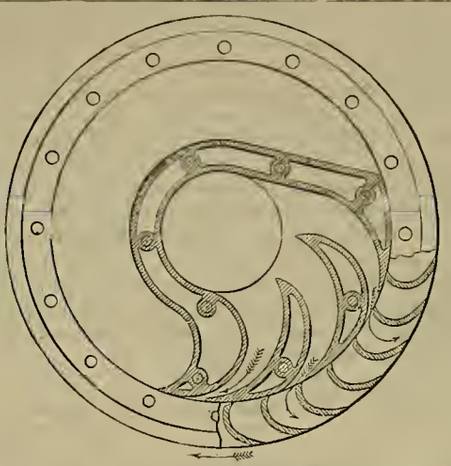

FIG. 2.—SECTION THROUGH ISSUES AND VALVES.

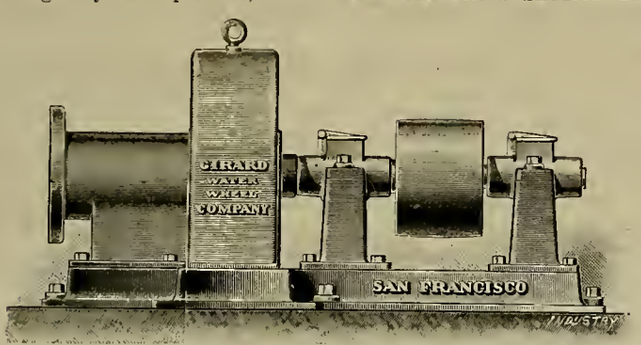

FIG. 1.—SIDE VIEW OF GIRARD WATER WHEEL.

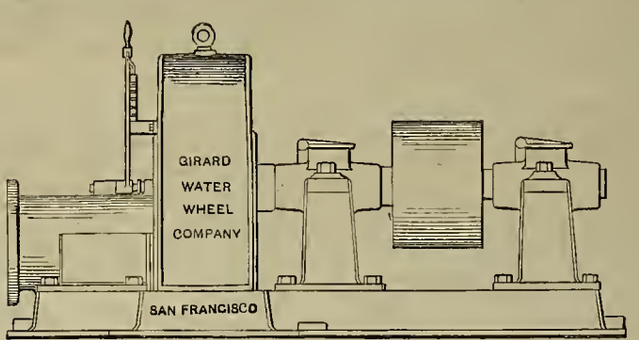

FIG. 3.—HAND REGULATION.

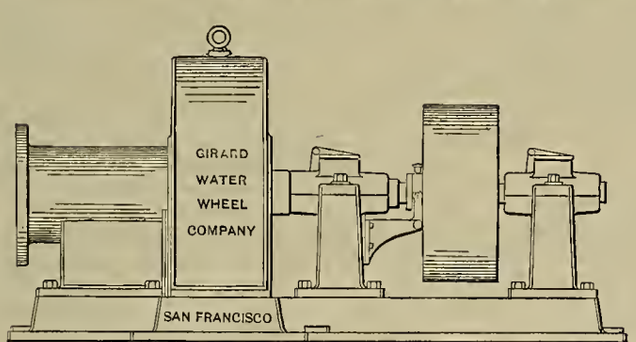

FIG. 4.—WATER WHEEL WITH INERTIA GOVERNOR.

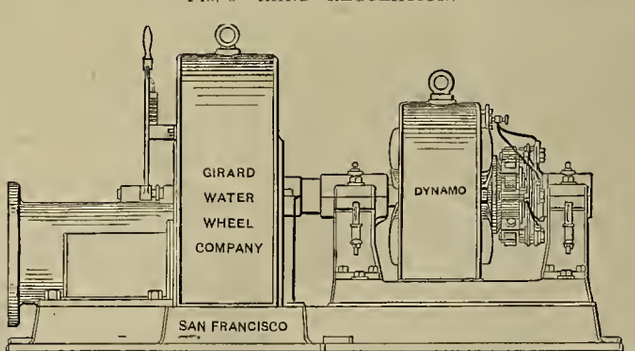

FIG. 5.—WATER WHEEL AND DYNAMO—HAND REGULATION.

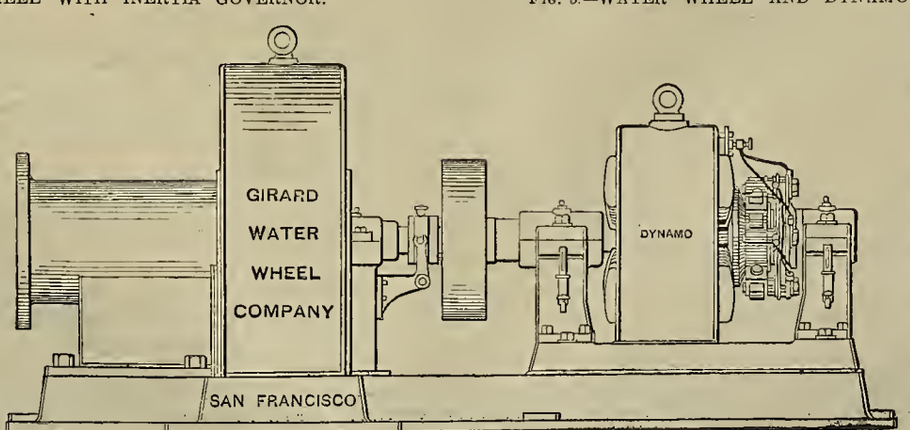

FIG. 6.—WATER WHEEL AND DYNAMO—INERTIA GOVERNOR.

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J. F. HALLORAN.....General Manager

San Francisco, April 27, 1895.

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"COMPETITION is worse than war and a curse to the country," says a San Francisco clergyman. Gold mining is the one business in which there is no competition.

IT is the opinion of several able lawyers who have been consulted on the subject that the product of the mines is exempt from income tax. The output of a mine, being a product of real estate, cannot be taxed under that law, and mining companies need not pay taxes on their net profits. Of course this is not ex cathedra, but is the likely result.

LYING before us is an address recently delivered by Mr. M. P. Kennard, at a meeting of the Bank Presidents' Association of Boston. In it he speaks of the gold dollar as "our historical and inevitable single standard." Lying beside it is a silver dollar dated 1799. Around the edge is the imprint "One Hundred Cents, Standard or Unit." Either the old silver dollar or Mr. Kennard is mistaken. Probably Mr. K. thinks back or knows naught no further than 1873, and dates history from that as the great era in earthly chronology.

PATENT OFFICE RULES 65, 134 and 68, which were issued February 4th, in consequence of the decision of the courts in the Berliner telephone patent cases, went into effect last week, although they will not interfere with the practice of the office for six months yet. Heretofore an application for a patent whose claim was rejected could hold it in abeyance for two years before altering his specifications or appealing for a new hearing, in the meanwhile shutting out other patents by making slight changes. At the end of two more years an application could be kept still pending, thus prolonging the life of inventions much beyond the contemplation of the law. In the Berliner cases the patent was in the office for about fifteen years and was then granted to run for seventeen years. The courts declared this action illegal. The new rules require applications and appeals to be made within six months and direct the rejection of any claims that have been pending for five years unless the applicant can show cause why the case was not rapidly prosecuted.

A PLACER COUNTY MAN writes taking issue with an editorial statement made last week in which, where discussing the attitude of the *Record-Union* toward hydraulic mining, it was stated that that paper "had a right to be wrong." He says he doesn't see how any one has "a right to be wrong," and thinks such a thing as "a right to be wrong" is a paradox and that one "must be either right or wrong." Just so; but he has a choice of either, and free will in the choice. There was and is no intention to juggle with words. The idea is this: take the question of protection, or religion, or any other matter of personal belief that divides men and makes them take sides. A believes in protection: he is a firm adherent of that doctrine. B, his neighbor, as good a man, as honest of intention and as desirous of prosperity, firmly believes in free trade. Now protection and free trade are directly opposite. If A is right, B is wrong, and vice versa; yet A must not be blamed for implicit belief in protection, nor B for advocacy of free trade. Each has a right to his honest opinion. But they can't both be right, and the one who is wrong has as good right to be wrong as the other whose opinion is orthodox, and that right must be respected, and not unjustly interferred with. So with any public question. The *Record-Union* has a right to honestly believe that hydraulic mining is an invention of the devil and destructive to the commonwealth. Of course it is hard to see how any one in California outside of an insane asylum can honestly have such belief; it would be infinitely more to the credit of any one possessing such belief to go crazy, as that would argue the possession of brains; but, the *Record-Union* has that belief, and though wrong, has a right to so believe. This applies solely to the domain of opinion, creed, belief. The realm of facts and actions is quite another thing. When the *Record-Union* makes malicious and mendacious statements it transcends all right of opinion and deservedly elicits censure and reproof; but so far as honest beliefs and opinions are concerned, any one and every one "has a right to be wrong," which, after all, is only another way of saying that we are always willing to concede to others the same degree of consistency that we expect shall be accorded to ourselves.

Wells, Fargo Cease Carrying Letters.

Wells, Fargo & Co. are about to quit carrying letters in the United States. In view of the close personal relations of that company to the miners of this coast, that announcement is one of more than ordinary interest and awakens many reminiscences. For a generation, "Wells, Fargo" have been the old reliable. They always charged big prices, which looked very large sometimes, but whatever was in the front boot generally went through at any cost, and many a time they constituted the only link of mail communication. No matter how deep the snow or bad the road; no matter who went wrong or what happened, the treasure box and the mail generally got through, and the calling out of the addresses on the letters was the event of the day in many a mining town in every nook and corner of the Pacific States and Territories. For a generation the company was a better mail carrier and gave the miners better service than the United States Government. "Two bits" was steep for a letter as compared with three cents, the government charge, but the letter with "Wells, Fargo" on it went to its destination, while the government red tape often made costly delay in the delivery of a plain United States stamped envelope. For many years the price of a "Wells, Fargo envelope" has been five cents, which in many cases included a special delivery where received.

Next to the MINING AND SCIENTIFIC PRESS, the Wells, Fargo letter delivery was the oldest mining institution on this coast or in this country, and the cessation of its operations is in one sense like hearing of the dissolution of an old friend.

Wherever a mining camp was started, the concern had a business office as soon as the saloon, notary public, assay office and corral were in operation, and some of the smartest men on the coast have been local agents for the company, whose daily or tri-weekly mail delivery began when a stage commenced running to the new town. Its operations were on a very large scale; as far back as thirty years ago the company bought annually 2,000,000 three-cent stamped envelopes.

It is doubtful whether its mail delivery ever paid as a special branch of the business, but it put the company into such familiar touch with the miners; it was such a convenience, that it induced considerable business that otherwise it would never have secured.

It will buy no more envelopes from the Government, and when the stock now on hand is used up, the old familiar "Wells, Fargo envelope," "Paid on our coast lines" will be only a memory.

An Interesting Report.

From John Hays Hammond is received the report of the British South Africa Company, at the meeting held Jan. 18, '95. The scope of the concern is something tremendous, comprising the government and operations of an empire. The territory embraces the greater portion of that part of Africa between the 8th and 34th degrees of south latitude and the 17th and 35th degrees of west longitude; considerably over 1,000,000 square miles. It tells of peace and war; battles, marches, victories, treaties and results; of trade and gain; labor, language, religion, railways and capital; of mining, profit and prospective action. Part of it is a story of a conquest; part of it a narrative of a concession; more of it a history of a new East India Company; other parts tell of transcendent gain and great possibilities: all of it is as interesting as any current literature. The report shows that the company's opportunity is a great one, its actions imperial, its monopoly absolute, and its aims purely commercial. Where it could not coerce it temporized; where it could not buy it bribed; where it could not do otherwise it played lesser powers against each other and aggrandized all.

Any one of its many operations would be of itself a very large business transaction. Its capital runs into the millions; its power is practically limitless; petty questions of jurisdiction and privilege are overridden, and with true British dominance it makes profit of minor necessities.

The report is a complete compendium of information. It tells how to get to its ports from any part of the world: the route, cost, time, etc.; whether from Capetown to take rail or stage or mules; how to arrange for food and transportation; the necessary outfit, etc., then passes to a history of "The Matabele War," with a complete account of troops, campaigns, and tables of killed and wounded.

Civil administration and governmental affairs receive attention; legislative and judicial departments, "foreign relations," postal service and other governmental branches being given attention—the whole thing reading like a government report.

A complete history is given of the gold development of the country: a list of all the districts with particulars of the work done in each district, the depth of the shaft, the width of the ledge, the ore assay, the net result in pennyweights and grains, with minute details regarding a multitude of mining properties. A table is given of 69 distinct and separate companies and syndicates—sub-schemes in whose interests the main company participates—followed by Mr. Hammond's report on the mineral resources of Mashonaland and Matabeland, to which previous reference has been made.

The different newspapers—seven in number—are described; agriculture, the Jesuits, native races, surveys, rules and regulations for taking up mining claims, how land can be secured, licenses obtained, and a variety of other topics are discussed.

Some idea may be had of the extent of the company's "mining business" from the summary showing that from December, '93, to September, '94—nine months—there were 21,783 mining claims registered in the Matabeleland districts. One item in the company's balance sheet of accounts reads as follows:

"Matabele War Expenditure—defences in Mashonaland and for protection of life and property—war material, viz.: guns and ammunition, wagons, horses, oxen, tents and volunteer equipment—food and supplies used during the war and sundry expenses, £113,488 2s 11d." That was just a little incidental matter of half a million dollars expended, it being necessary to have peace even if they had to fight for it, on the same principle as in the old days at Pioche, Nev., when fighters were paid $20 a day by the Raymond and Ely and Hermes Companies to "stand off" rival claimants.

The whole thing is the chronicle of an empire, the opening chapters in the history of a new world where none but the daring venture and none but the strong survive, and is a straightforward and valuable account of the subjugation and development of a rich and savage region by the dominant race.

Concentrates.

THE mines around Butte, Montana, produce 8000 tons a day.

THE Gold Bluff mine near Downieville, Cal., is temporarily closed.

BUTTE, Montanu's, new directory cluims a population for that city of 51,579.

THE new directory of Helena, Montana, gives that city a population of 23,649.

THE Culumet und Hecla has declared a $5 per share dividend, payable Muy 10th.

THE iron in the tailings from the Pilot Bay smelter runs four to five per cent nickel.

CREEDE, Col., mine ownors have determined to pump out the mines and sink deeper.

THE Santa Rosa und Good Hope mines, Riverside Co., are about to give the cyanide process a trial.

T. H. TREVITRICK, a miner in the Hibernia mine near Burlington Montanu, was killed hy a cave lust week.

A. W. LYMAN, editor of the Helena *Independent*, is the only newspaper man in Montana who has to pay an income tax.

THE Reymert Mining Co. have bought the Mountain Chief mine in Humbug district, Yuvapai Co., Arizona, for $40,000.

SUPT. TAYLOR informs the Grass Vulley *Union* that a five-stamp mill will in a few weeks be placed on the Daisy Hill mine.

THE Daly, Utah, Company last Saturday shipped to San Francisco nineteen hars of silver bullion, containing over 22,000 ounces.

A Two weeks' run of a ten-stamp mill has netted the owners of the Royal Mining Company in Granite county, Montana 380 ounces of gold, worth $6,000.

THE machinery from the iron mine at Hotaling, Placer Co., was tukeu to Oukland this week, thus ending many high hopes. There is plenty good ore there.

HEAVY rains in Kern county have so contrasted the usual with the occasional as to interfere with the working of the dry washers at Red Rock and Goler.

THE Minnesotu Legislature has defeated an effort to establish a tax on the valuation of the mining properties instead of the output of the mines in that State.

A NEW miniug district is being opened thirty miles east of Walter station on the S. P. R. R., in Riverside county. The rock is reported to average $40, free gold.

THE steamer Lucy, used as a tug by the Treadwell Mining Company of Alaska, was wrecked on the 8th inst. off Port Houghton, Alaska. The crew was saved.

BINS are hcing received for pumping out the Granite Hill, Nevada Co., mine, preparatory to resuming work. An assessment of five cents per share has been levied.

THE Electric Power Co. are at work at Kernville, Cal., on their 60-ft. ditch which will discharge fourteen miles below with 230 feet fall, furnishing light nnd power.

THE Great Western Mining Company has heen formed in Spokane with $1,000,000 capitul stock to work the Great Western and Garden Chariot claims on Trail creek.

WILLIAM A. CLARK, of Butte, Montana, confirms the report that he will he the principal holder in the company that has purchased the brass plant of Wallace & Son, Ansonia, Conn.

WORK will soon commence on the erection of additional machinery at the Mammoth mine, Tombstone district, Arizona. When completed the mill will have a capacity of 300 tons per day.

ANN now South African analysts tell us that from thirteen 200-pound coal samples from the Witwatersrand an average of 3¼ dwts. of gold to the ton of coal has been obtained. What next!

ANTIMONY is abundant in different portions of this State. The only antimony smelting works in the United States are in San Francisco. Fifty per cent ore is worth about $50 per ton in San Francico.

THE Holy Terror property in the Black Hills, which South Dakota papers say has been turning out a daily net profit of $7000, has hecn shut down, hoth mill and mine. Litigation is the declared cause.

TRINITY county miners met at Weaverville last Sunday and subscribed a handsome sum to aid the California Miners' Association in their effort to protect mineral land from absorption by the railroad companies.

THE suit brought against Sheriff Gregory in the United States Circuit Court by the General Electric Company for $8000 on account of his detention of certain mining machinery at the Gover mine was dismissed.

SILVER is quoted at 67. The upward tendency of the white metal is very encouraging to the miners of Montana, but it must go to 80 cents an ounce before the average Montana silver mine can be worked at a profit.

COMSTOCKERS wherever scattered over the world will be interested to hear that the present proprietor of the International Hotel, Virginia, Nevada, has proposed to a Renoite to move the hotel to Reno. It orginally costs $280,000.

THE consideration in the Monte Cristo, Iron Horse and Enterprise deal, in the Rossland, B. C., district, was $65,000, of which ten per cent was paid down to the owners. Development work will proceed at once on the Iron Horse and Enterprise.

NEARLY one hundred square miles of placer ground has been secured hy New York men along Four Mile creek, Kautt Co., Colorado, who say they have $10,000,000 in sight. Forty miles of ditching and piping will be necessary to work the gulches.

ARTICLES have been filed at Spokane, Wash., to incorporate the Ohio and Idaho Mining Company, capital stock $50,000. Trustees—B. F. Lee of Lake Brady, Ohio; N. A. Clark, Cleveland, Ohio; W. I. Hinckley, A. B. Keeler and C. F. Lee of Spokane.

AS AN illustration of what new and proper mining methods will do, the Prescott *Courier* cites the instance of Lynx Creek, Arizona, where for twenty years nothing could be done with mines and the section had a veritable black eye. Now the entire district is a hive of industry, new machinery is constantly going in and $12 per ton ore is worked on a large scale with profit, while $30 concentrates are considered good. The day when only $100 ore could be handled has passed away.

THE Hecla Consolidated Mining Company of Glendale, Mont., paid last Thursday dividend No. 138, $15,000, being one per cent on the capital stock, making $60,000 paid in dividends this year, and a total paid by the company up to date of $2,070,000.

THERE is a water famine reported in Candelaria, and the residents are obliged to get their supply of that liquid from the locomotive tanks. The pipes that convey water from the White mountains to Candelaria burst last winter, and have not been repaired.

DURING the first three months of this year the Arizona copper Co. and the Detroit Copper Co., whose works are at Clifton and Morenci, Arizona, have shipped 4,265,835 pounds copper. The shipments for the last six months of '94 aggregated 8,688,307 pounds.

IN the Superior Court, this city, M. Thompson charges his partners, T. Clark and W. C. Stratton, with having unjustly withheld $78,000 due him under a partnership agreement in the Grand Victory mine, near Placerville, and wants a receiver appointed and the partnership dissolved.

IT is said that at one time after the breaking of the Utica dam at least seventy-five men were searching along the creek for gold. One person found a nugget worth $16, and many other chunks of the precious metal of considerable value were picked up along the course which the water traversed.

RETRENCHMENT has found its way into the constitutional convention of Utah. Salaries of State officers have been fixed at the following figures: Governor, $2000; Secretary of State, $2000; Auditor, $1500; Treasurer, $1000, Attorney-General, $1500; Superintendent of Public Instruction, $1500.

ACCORDING to a New York City paper Wall Street men have secured some auriferous property in North Cnrolina, where they hire natives to walk around and pick up gold nuggets. This is almost as good as the forming of an administrative alliance to secure U. S. bonds at less than par value.

DON MANUEL RIVEROLI, the discoverer of the copper mine at Santa Rosalia, has been arrested at Ensenada on orders from Governor Sangines, charged with the theft of a gold bar valued at $12,000, placed by the Ibarra Gold Mining Company in his charge, and which was stolen on the night of March 20.

THE Shasta County Development and Mining Company has incorporated; capital stock, $200,000. Object, to work and develop mines and mining properties in California and particularly in Shasta county. A. M. Graham, president; W. Foster, vice-president; J. A. Davis, secretary, and J. W. Fitzpatrick, treasurer.

F. X. PIMENTEL, F. F. Wetherbee, A. Miliken and S. Yriharren, with other parties, have organized a company in Durango, Mexico, to work the Jahrennio mine in Otaiz district. The company is heavily capitalized, and is credited with ability to immediate'y put half a million dollars into the enterprise.

THE Alaska Treadwell Mining Company has declared a quarterly dividend of 37½ cents per share, amounting to $75,000, payable next Monday. During March there was a profit of $20,455. The bullion shipped showed an average of $2.34 per ton of ore milled. The sulphurets yielded an average of $51.91 per ton treated.

IT has been known for years that the Contra Costa range carries mineral deposits—gold, silver and coal. Several prospects have been made in years past that were quite promising, hut the deposits have been small, excepting coal. F. Bohmer of Alameda has discovered hack of Fruitvale what he thinks is a rich silver mine.

THE American Mines Association, of Chicago, is attracting unpleasant notoriety. A capitalization of $25,000,000 is claimed and a dividend of sixty per cent on the total capital paid in. The assertion is made hy them that the Independence mine of Colorado has paid $5,800,000 dividends in two years. The Association's future seems to be behind it.

WILLIAMS & SONS, of Austin, Nev., have had several persons engaged of late grubbing up sagebrush, which they will burn as fuel in their flouring mill. Mr. Williams says he will determine which is the cheaper fuel, sagebrush or wood. In certain parts of the State sagehrush is used in quartz mills, and it is claimed that it is better than wood for heating purposes.

LAST Monday the Debris Commission granted permits to P. Phillips, W. and W. J. S. Bacchi and D. Croft of El Dorado Co., and J. J. and A. A. Hoffman of Placer Co. Authorizations to construct impounding dams for hydraulic mining were granted to J. Ward, W. McDonald and W. Henning & Co. of Placer Co., and W. F. Coe, J. C. Day and E. Russell of El Dorado Co.

WHILE working in a fifty-foot raise in the Monitor mine at Pioche, Nevada, last week, Frank Weidner got a dose of sulphuretted hydrogen gas and miraculously escaped death. After becoming senseless he fell on a plank in the top of the raise, where he hung for several hours until discovered by William Hammond and J. Bayle, who lowered him down to the tunnel level and brought him to the surface.

TEN YEARS ago all except the most sanguine miners would have told you that there were no gold mines around Ophir that would pay, but they did not at that time look forward to the improved methods of mining, milling and transportation, says the Ophir, Colorado, *Mail*. Ten years ago packing and milling cost $20; to-day the same ore is being mined, transported and milled at a cost of less than $5 per ton.

A FRENCH syndicate is thinking of paying $1,000,000 for the Mercur, Utah, mine. The monthly statement of the Mercur Company for March shows a net revenue from hullion sold of more than $49,000. That was for a total tonnage of ore of 4770 odd, making an average net return per ton of $10.50. Out of the amount the company paid a $25,000 dividend, all mining and milling expenses, officers' salaries, many necessary and usual expenses, and still had nearly $7000 surplus.

OMAHA and Denver smelters have introduced a device similar in effect to that used here for recovering minerals that pass away in smoke and fumes. It consists of a horizontal flue 1500 feet in length, exposing a surface for radiation and condensation of the heated gases of 54,000 square feet. Through this flue are drawn the fumes by means of a fan, the outer circumference of which revolves with considerable velocity, the fumes being forced into a spacious building, from which there is no means of escape except through a filter of textile fabric, the colorless gases passing through into a stack beyond, while the valuable soot or smoke condenses on the under side, from which it is collected from time to time, compressed into molds, and fed back again into the furnaces, where the valuable metals are extracted and separated.

SPEAKING of the late strike made in the Murchie mine, near Nevada City, the *Transcript* says: "Here is another instance of resuming work on a mine that had not been operated for ten years or longer. When the mine was being worked before, from fifty to eighty men were employed. After taking out all the best quartz that was in sight, the employes were discharged and later the mine was closed down completely. Since operations were resumed, considerable prospecting has been done, and as a result the company now have two fine ledges with an abundance of good quartz in sight to keep even a larger mill than they have running night and day for a long time.

THE history of the Londonderry mine, Coolgardie, West Australia, is interesting and instructive, if not edifying. Its original English purchasers sold it the other day, as it were, for $2,000,000. The directors of the new company met; amid much enthusiasm they were told that within sixty days five tons of gold would be mined from the company's property. The London mining paper from which this is concentrated has "Hear, hear," and "cheers" scattered through the statements. Meanwhile the directors had telegrams in their pockets telling them that "the reef was barren," and after they had unloaded, the news got out, and now the purchasers of stock say they have been swindled. It does look that way.

THE first shipment of gold bars from the new mill of Capt. J. R. De Lamar nt De Lamar, Nevada, reached Salt Lake last Saturday. There were $40,000 worth of gold in the shipment, the production of less than three weeks of operation. To transport the bullion from the De Lamar camp to Milford, on the Union Pacific, an overland trip of 170 miles, a Concord coach was provided and in it a globe safe containing the hars was deposited. Relays of fresh fours of horses had heen sent on ahead, and with the coach started four outriders armed with Winchesters and carrying an abundance of ammunition. The route was covered in about forty-eight hours. Hereafter shipments of bullion will be sent out about every week and the guards will be kept going along the road. The gold is consigned to the Wells, Fargo & Co. express.

THOS. MEIN, general manager of the Robinson Gold Mining Co., Witwatersrand, Transvaal, Z. A. R., sends us the 7th annual report of the company's accounts for the year ending December 31, 1894. During the year 50 new stamps were ordered added and seventy stamps were run from March 1st. The year's output of ore was 107,935 tons; from the mill was taken £402,330; from 2997 tons chlorinated concentrates was produced £57,981, and 70,525 tons tailings, treated by the cyanide process, yielded £65,397. The ore was wholly pyritic. During the year 234 Europeans and 1195 natives were employed; the latter were paid $3.62½ average wages per week, exclusive of food. The company's profit for the year was £346,628 13s 2d. The cost per foot of the 11,976 feet of development work was £2 19s 1d. The cost per ton of mining and milling the ore, exclusive of mine development, was £1 1s 8d. Fuel cost £3,706; water, £1,743. The report is an elahorate one, statistical and comparative with previous years, and interesting in every detail.

"THE appeal of the Cassel Gold Extraction Company, Limited, against the decision by which Justice Romer invalidated the MacArthur-Forrest patent," says a London technical journal, "has been dismissed by the Supreme Court. Lord Justice Smith's exhaustive judgment will probably not deter the plaintiffs from carrying their case to the House of Lords, as the interests involved are of considerable magnitude. It is noticeable, too, that the court arrived at their decision with great reluctance, inasmuch as the invalidation of the patent was not influenced hy any hut the most technical grounds. The patent has been upset simply because of a superfluous clause in the specification. In the words of the judge, 'had the first claim been omitted, we should not have been faced with the difficulty we are; . . . and for this reason, and for this alone, we must give judgment for the defendants.' It is undouhted that this decision involves much hardship, and brings into question one of the points with which the new Patent act is specially intended to deal."

THE Gold Dredging Company, a Chicago concern, controls three miles of placer ground on Crasshopper creek, adjoining Bannack, Montana, and is building a steam dredge to be placed in a scow, to dip the gravel and elevate it into a sluice hox, twenty-five feet nhove, in which the dirt will be sluiced. The power to he used is water power and electricity, including light, by means of which operations will go on hoth day and night. The water used for the generation of power has a full of 350 feet, which will give 250-horse power. The capacity of the dredge is estimated at 4000 cubic yards per day. Should the dirt yield but fifteen cents of gold per cubic yard, equivalent to one cent per pan, the profits will he great. S. S. Harper is manager. A force of forty-five men is employed at present, hut this will he increased to seventy-five as soon as dredging hegins, ahout May 15th. The amount of money expended hy the company so far is $98,000. The scow, which is now heing huilt at Bannack has a length of seventy-five feet and a width of thirty-six feet. Over 100,000 feet of lumher is heing used in its construction, and it is designed to carry sixty tons of machinery. The estimated dredge capacity seems high. A dredge that can handle one-fourth that much and do it right along will do very good work.

Personal.

T. J. BARBOUR, representing the Risdon Iron Works, has returned from southern California.

W. F. NEWELL, of the Selhy Smelting and Lead Co., is in Arizona, and will visit Mexico before his return.

F. N. SPEAR, manager Bradley Pulverizer Co., manufacturers of the Griffin mill, has returned from Boston.

MR. J. D. WEEKS, M. A., of Pittsburg, has heen elected president of the American Institute of Mining Engineers, in succession to Mr. John Fritz, of the Bethlehem Steel Company. The Institute has now a membership of something over 2200, including the most distinguished metallurgists and mining engineers in America and abroad.

Minas Prietas Camp, Sonora, Mexico.

In Sonora is a camp that is the Mecca of many a poor devil's pilgrimage, where men have headed for from every point of the compass. Every part of the world is represented there, and I dare say none of them ever made money any faster than right here.

I refer to the Minas Prietas camp, out of Torres, seventeen miles from the Sonora railroad.

The camp lays no pretentions to beauty. Streets there are none—just irregular rows of houses. The houses are adobe mostly, in various stages of dilapidation. Of stray dogs and burros and beggars there are more than you could shake a stick at. And the camp makes no pretentions at being a health resort. They have small pox all the time there, and pneumonia makes inroads among "the boys," and it is dusty and hot, and water is so scarce that the peddlers do not get into town with it. Yet there is no denying that Minas Prietas camp is attractive. There is ever the attraction of gold, and, where that is, hades itself would not deter. And the Minas Prietas is not nearly as bad as that. With its few drawhacks it is a good camp. There is always the music of three stamp mills playing golden chords, saying nothing of a Huntington plant and another twenty-stamps that will soon add their roar to that already there.

The inhabitants are such as may be expected in such a place—mostly natives, with Arizonans next, and lastly other foreigners. Good wages are earned and living is cheap. Pay runs from a peso and a quarter to $5 a day in gold. Living—that is, board—is fifty cents a day (American), with room rent in proportion to $25 to $50 a month for a house. Those with work appreciate having a good thing and hold on, while there is many a poor devil waiting for work. Let warning be taken now. They have extra labor enough in idle men waiting for jobs in Prietas to supply the places of all who may get sick, die or go away for the next year to come. I met an old man there who mistook me for a resident. He told me that he had walked all the way from the United States there, and wanted to know of the probahilities of his getting work. I saw him a day or two afterwards, and there was in the droop of his countenance a picture of utter despair. Of Tucsonites they have a dozen or so working in the mines and mills, with rather more from Nogales. Other parts of the Territory also come in for representation.

The sources of income of that camp are five or six of the best gold mines in the world. And the grand total of them is probably the very best gold camp in the whole world. When ore is so very good that they sack it in the mine, just to get it safely to the surface to mill; when the laborers will steal ore and gouge out their candles and fill them with the stuff; when dividends of $1900 a share—each share a twenty-fourth—are declared, as the result of a month's run of one mill, and that mill being of ten stamps, then some justification is found for the statement that therein is found probably the best gold camp in the world.

In the camp are seven mines, viz: The Verde, Creston, Prietas, Colorado, Amarilla, Santa Cruz and Grand Central. There is quite an assortment of colors—green, black, red and yellow. These mines are in all stages of development, from the Santa Cruz just being opened, to the Prietas which is no longer worked.

In Sonora they swear by the wealth of the Colorado mine. From this property more gold has probably been taken than from any other mine in Mexico. The output since the early '80s has been $20,000,000. Of this amount $11,000,000 has been dividends. Single bars of bullion valued at $40,000 have been shipped from the Colorado mill. The ore is in a twelve-foot vein, and varies from such a low grade as to be left in the mine, to the rich stuff which is full of "wire" gold that is worth a dollar or more a pound. The average value of the ore worked is about $30 a ton. The mine is down 650 feet. Five miles of work have been done in the Colorado. On the upper levels the paying ore is considerably stoped out. The richest ore was found in the second and third levels.

The mill is of thirty stamps, and its capacity is ninety tons a day. Not a moment is lost from one month's end to another at the mill. As continually as possible, days, nights, Sundays and holidays, the stamps chew up the ore. The property employs 150 men.

The Creston mine is a continuation of the Colorado. Here, too, the work is down 650 feet. The mine grows richer with depth. The ore mills an average of $14 a ton, and 100 tons a day are being worked, the results of which amounting to $1400, the expenses being $475, leaving a net profit of $925 per day. Considerable water—20,000 gallons daily—is encountered at the lower depths. On the 26th of last month the pumps got out of order and were flooded, requiring the placing of new ones in order to uncover the old pumps. Some rapid work had to be done.

The Crestou ore is worked at the old Minas Prietas mill. This mill is of forty stamps, working 100 tons a day. About 120 men are employed in mining and milling the Creston ore. Like the Colorado mine, the Creston is under the management of the heirs of Chamberlain & Price, Ohio people.

The Prietas is a mine of the past, the Colorado is a mine of the present and the Amarilla is a mine of the future. This last-named property is the talk of half of Sonora. One old Mexican recently described its output as being "oro puro." While it is hardly pure ore, it has free gold in quantities enough to justify its being prized as a very big thing. For the month of February the mine's dividends were $1900 a share, each share being a twenty-fourth. The mine pays dividends while a mill is being built, and the ore is being hauled by ten-mule teams to a neighboring mill—the Grand Central. So rich is the ore that guards follow the wagons from the mine to the mill, to see that none of it is stolen; it is very free milling, and is said to run from $200 to $600 a ton. The width of the ledge is from five to twenty-five feet and grows wider and richer as depth is attained; its dip is about 80°. There are three shafts on the property, one being down 165 feet; and a contract has been let for sinking a new shaft 1000 feet. When this is done the Amarilla will probably drain all of the water of the district to itself, and thereby will solve the vexed water question—for that management.

The Amarilla was a blind ledge, parallel to the Colorado, and was located in August, 1893, by Pedro Negro, an Italian. The purchaser was Howell Hines, superintendent of the Colorado-Creston; he had twenty-two shares, John Hines (his brother) one share, and Robert Stein one share. An engineer in the Colorado had a chance to get a partnership in the property, to the extent of two or three shares, but he had no faith in it. The price paid for the mine was $50,000. It is said that $2,000,000 was refused recently. A twenty-stamp mill, with amalgamators, pans and settlers, is now being erected; its sides and roof are to be covered with corrugated iron roofing instead of lumber sheeting. The mill is not over the shaft, there being a bucket-line of twenty buckets from the shaft to the ore bins. About 100 miners are employed in the Amarilla.

The Verde is another rich property, running parallel to the other ledges. The ledge is six feet wide and the ore runs $300 to $400 a ton. So rich is the ore that it is sacked to be brought from the mine to the mill. When I was there last week the mill was shut down while the pumps at the Creston were being gotten in order.

The Verde is owned as follows: Howell Hines, twenty-one shares; Superintendent McGregor, one share; John Hines, one share; Mr. Goodwin, one share.

The mill is a Huntington with Frue vanners, and works about eighteen tons a day.

The Grand Central mine is another rich property, owned by a Mr. Seymour, of England, who came to the camp after the Cerro Blanco fiasco. About a mile of work has been done in the mine. The lowest grade ore is said to be $12 per ton. The management is said to be in close straits for water, having been shut down, so far as the Grand Central ore is concerned, for eight months. The mill of ten stamps is now rented to the Amarilla management, who get their own water. Mr. Seymour is "between the devil and the deep sea," as to selling the mine or developing water.

The Minas Prietas is the pioneer mine of the district, worked down 500 or 600 feet, at which time fire burned out the timbering. It belongs to New York capital. There is talk of renewing the work there.

The Santa Cruz is a newly opened ledge near the Amarilla, and will be worked in connection with that mill.

The whole district is No. 1. The mines are worked with American foremen and Mexican and Yaqui labor. The mine laborers lose no opportunity to appropriate the "wire" gold to their own use. The hollowing out of their candles and concealing gold therein I have already mentioned. Another trick is to have a bundle of cigarettes. The cigarettes are filled with wire gold. A red handkerchief full of rich stuff has been sent out with a car of waste, in the hope that, the waste being also red, it would not be noticed. The handkerchief was espied on the dump by the keen eyes of Howell Hines, and investigation brought to light several hundred dollars worth of gold.

The miners work almost naked, the lower levels being very warm, so they have little chance to smuggle out gold in their clothing.

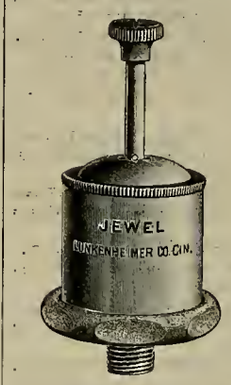
The settlements are divided into two towns, Colorado and Minas Prietas. The railway station is seventeen miles away, and seven stages run between the two points. Sometimes, even with that number of conveyances, passengers are left behind. P. H.

The bottom of the Atlantic forms a sort of terrace along the continent, sloping gradually for several miles, then suddenly descending to a far greater depth. In general, about 100 miles from the shore there is a depth of 100 fathoms, but in ten miles the depth exceeds 1000 fathoms.

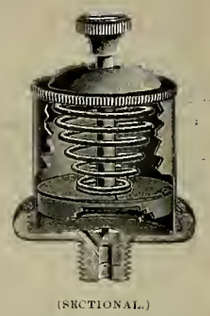
Brazil is a Portuguese word, signifying "a live coal." It was given in allusion to the abundance of red dye wood found in the forests.

The Lunkenheimer "Jewel" Grease Cup.

The engravings below represent the latest achievement in the grease cup line, made by the Lunkenheimer Company of Cincinnati, Ohio, with branch offices at No. 51 John St., New York, and No. 35 Great Dover St., London. It has been designed to meet the demand for a simple and inexpensive automatic grease cup and to take the place of iron cups, being stronger and lighter in weight. The "Jewel" is admirably adapted for shafting, loose pulleys, friction clutches and many other places. The base is of cast brass, while the top is of tubing and spun brass. It is of brass throughout, has a leather-packed plunger and is provided with a feed-regulating screw in the base of cup, which will admit of perfect regulation of feed. The makers claim this cup to be far superior to iron cups and is offered at prices that defy competition.



EXTERIOR VIEW WITH PLUNGER DRAWN TO TOP OF CUP.



(SECTIONAL.)

CUPS EMPTY WITH PLUNGER AT BOTTOM.

The working of the cup is as follows: When empty and plunger is at bottom of cup, unscrew and take off the reservoir; then lift the plunger to top of same and secure it in this position by means of the lock arrangement, then fill the reservoir with grease, screw it back into its base, release the spring lock so as to put the pressure on grease and the cup again feeds automatically until empty. The feed-regulating screw in base of cup permits adjustment of the opening through the shank of cup to suit any kind of grease.

This cup is claimed to be the simplest, most efficient and lowest priced automatic grease cup on the market. This company, besides making the above, offers several other styles of grease cups for various purposes, as follows: the "Ideal," "Marine," "Tiger," and "Ohio" grease cups. Full particulars can be had by addressing the company. Catalogues, circulars, etc., upon request.

A New Use for the Air Caisson.

Some months ago the Santa Fe Placer Mining Company, of Kansas City, Mo., desired to thoroughly test for gold the material forming the bed of the Galisteo river near Santa Fe, New Mexico, and as the material was strongly impregnated with a subflow of water from top to bottom, the usual method of cribs and pumps was not attempted, and the idea of using an air caisson was conceived as the only *certain* way by which bedrock could be reached and the material given a thorough test.

In pursuance of this plan, an air caisson was constructed of one-fourth-inch steel, cylindrical in form and twenty-nine feet long, in two sections for convenience in handling. The lower section contained the air chambers and was divided into two compartments by three-sixteenth-inch steel heads fitted with air locks 18x22 inches. The lower lock was placed eight feet from the bottom and upper lock six feet above the lower one. The upper section was a shell and was fastened to the lower part by 3x3 angle iron and bolts, and all fitted with air and blow-out pipes, valves, etc.

The caisson was built with straight sides, *i. e.*, without batter, so that it could be withdrawn from the ground and again used.

Equipped with the necessary power, air compressor, derricks, etc., the company began the prospecting work on their property, which consists of about four miles of the river bed, on Nov. 20, 1894, and finished the work about ten weeks later.

The caisson proved eminently successful in every way, disclosing the material from top to bedrock, from which cube-foot samples were taken at each foot of depth reached and given a careful analysis. The remaining material was blown or hoisted out, as its nature required, and was sluiced by the usual methods. From five to fifteen pounds air pressure was maintained, according to the depth reached and the compactness of the material being penetrated. At a depth of twenty-eight feet the caisson required a sinking weight of about 50,000 pounds to overcome the friction and lifting power of the air forced into it. The material penetrated was sand, gravel and stones, with an occasional thin streak of adobe.

Some uncertainty was felt as to the possibility of

pulling the caisson out after it was sunk its length, but this was removed when the trial was made. With slings about it connected with a steam hoist and an air pressure pumped into it, after letting in one or two feet of water to act as a cushion, of twenty pounds to the square inch, it came up "too nice for anything," and the plant moved to another location for a similar test.

It might be proper to add that the gold disclosed by the caisson was as satisfactory as the workings of the caisson, and the company is now receiving bids for a steam dredge, centrifugal pumps, etc., with which to secure their find. A conservative estimate of the coarse gold, based on the disclosures made by the caisson, is six and one-half millions of dollars' worth of gold in the property of the company.

As this is the first instance, to my knowledge, where the air caisson has been applied to this use or has been constructed with the intention of pulling it up bodily to be again used, the experience is mentioned in the hope that it may be of value to others having the same problem, and I shall be pleased to answer any inquiries as to cost and details at any time.

F. E. NETTLETON,
Kansas City, Mo. General Manager.

Santa Fe Placer Mining Co.

The accompanying map shows the property of the Santa Fe Placer Mining Co., New Mexico.

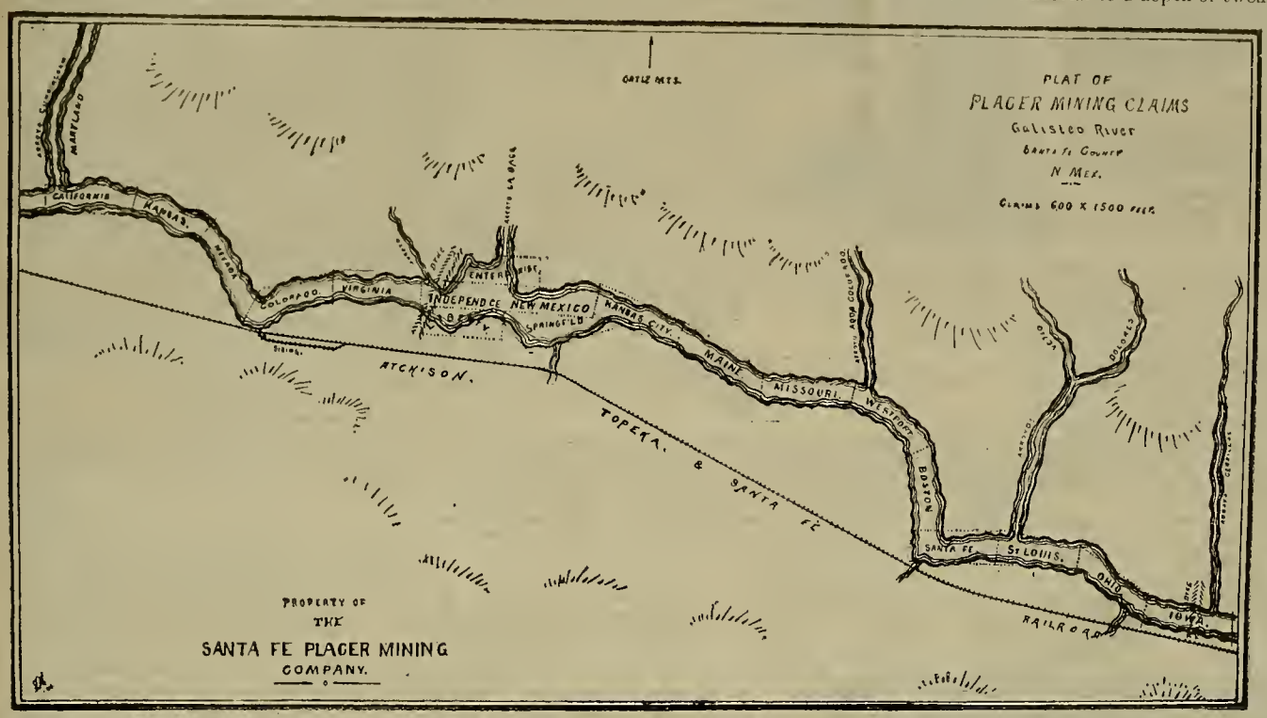
The property of this association consists of some four miles of the bed of the Galisteo river, comprising twenty placer mining claims of twenty acres each, each claim being 600 feet wide by 1500 feet in length, situated in Santa Fe county, New Mexico, about twenty-five miles from Santa Fe, on the line of the Atchison, Topeka and Santa Fe Railroad, the nearest station being two miles from the lower claims.

The Galisteo river flows at the northern base of the Ortiz mountain, which covers an area of about 100 square miles. Immediately under both the northern and southern slopes of the mountain are deposits of placer gold, which have been worked since 1711 A. D. by the Spaniards, and by Aztecs prior to that time.

All the gold in these deposits has been eroded from this mountain. The claims of the association have been located to embrace the mouths of the principal arroyos or gulches which lead from the "Old Placers" on the north side, so that the gold wash is concentrated in this property, from which there is no exit except down the river; and because of the semi-suspended condition of the material in the water of the river, also the specific gravity of gold, it is assumed that the greatest deposits would be found near the bedrock of the river. The preliminary work just completed goes to show the correctness of this theory, and that the sub-flow of the water in the river extends from the surface to bedrock.

The preliminary work also demonstrates there are no large boulders at the bottom of the river. The material to a depth of twenty feet can be taken out by means of a centrifugal pump at an alleged cost of not to exceed five cents per cubic yard.

The association has been incorporated under the laws of New Mexico, with a capital stock of $100,000.



Rubies of Burmah.

A large quantity of the world's supply of rubies comes from the Burmah mines, which have been actively worked since the annexation of Burmah by the British Government. The ruby district is about twenty-six miles long and twelve broad and lies at elevations varying from 4000 to 5000 feet above the sea level. Some of the mines have been worked by the natives from very remote periods—in fact, old workings are found over an area of sixty-six square miles. It is in the lower clay beds of the river alluvia, and in similar deposits formed in gullies in the hill-wash, that the rubies, spinels and other gems are found. In the alluvia, square pits from two to nine feet across, ingeniously timbered with bamboo, are sunk to the ruby earth, which is drawn up by bamboo baskets. In the hill-wash, long open trenches are carried from the sides of a gully. Regular mines are opened in some places; in others the limestone is quarried.

JAPAN could, if obliged to, put 500,000 trained soldiers in the field. She probably did not employ over 100,000 in the late war.

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The Girard Water Wheel Company.

Continued from page 257.

of regulation as to speed and capacity without loss of water, and will operate with the same efficiency under great changes of load and quantity of water applied and are capable of receiving a large volume of water on a small wheel, so the speed of revolution can be made to suit any case without gearing. The issues or nozzles can be of any number, from one to a dozen or more, and in regulating, these issues are entirely cut out, or their area changed, so that all the water applied on the wheel meets the vanes at full head and pressure. Throttling the water supply and diminishing the pressure is not necessary, this being an important point, for the speed of a water wheel being as the head or pressure, throttling the water with any kind of a valve in the supply pipe lowers the pressure, changes the relative velocity of the wheel and water, and efficiency rapidly falls off.

The water is applied on the interior of the wheels, and passes out radially through the rim assisted by centrifugal force, and falls clear of the running elements. The efficiency need not be a matter of discussion, as any competent engineer capable of analyzing the nature of forces, and with knowledge of hydraulics, can easily compute the efficiency of water applied on this method. It is claimed by the makers that no other type of water wheels can give out more power with a given amouut of water under heads from 20 to 2000 feet. The diagram, Fig. 2, shows the manner of applying the water, and the curves indicate its course through the wheels.

The automatic governors employed by the Girard Water Wheel Company to control the regulating apparatus are much more complete than any that have been applied in Europe. They operate on the inertia system—not by both momentum and inertia, as in the case of steam-engine governors, but by the inertia of the driven machinery communicated through the driving pulley and opposed by centrifugal weights, so the whole power of the wheel is communicated through the governor. This is au intricate matter not easy to explain without drawings, and difficult even then. The most marked feature is that the governor will, at its neutral or normal position, where common governors have but little effect, exert full force either way for minute changes.

For low heads, from twenty to fifty feet, the water can be applied all around the wheels if required, because one nozzle or issue does not interfere with another, and they can be placed nearly together, being separated by thin guide vanes only.

M. Guyelin sends elevations of the late plant designed by him and now in use at Niagara Falls under a head of 140 feet. The Fourneyron type of wheels for the main plant, that of the Niagara Falls Company, were made from designs supplied by Messrs. Faesch & Piccard, of Geneva, Switzerland. The Guyelin-Jonval wheels were contracted for subsequently, but are the first at work, and have been running for nearly a year past.

The Jonval, as a pressure turbine, in which class it is supposed to helong, is readily adapted to operate as an impulse or unfilled wheel. The drawings received from M. Guyelin render it difficult to determine how far his plans involve impulsive action, hut the general design appears superior to that of Messrs. Faesch & Piccard. Since Atkins' invention, forty-two years ago, these new wheels at Niagara Falls are almost the first examples in impulse waterwheel practice in this country, except the tangential type made on this coast, meutioned above.

It is of further credit to San Francisco that the subject is taken up here in a manner that indicates thoroughness, and with improvements that adapt the wheels for use on this coast—that is, with economy of water and good regulation under high heads and small volumes.

The drawings herewith, Figures 1 to 6, especially the diagram Fig. 2, will explain the nature of the wheels and the modifications proposed by the Girard Water Wheel Company, who are now building wheels of this kind at their works, 34 and 36 Main street, San Francisco, Cal.

Use of Petroleum to Prevent Boiler Incrustation.

Although petroleum was used for this purpose as early as 1875, there has been until recently great division of opinion upon the subject. Roman Zalocieckl concludes that the negative results hitherto attained with petroleum are due solely to lack of practical experience in using it. Either was the quantity employed too large or too small or the oil not sufficiently refined. Too much petroleum will cause an incrustation upon the lower wall of the boiler next to the fire, that easily leads to a burning through; while a poorly refined product, because of the acid it contains, attacks the rivets so that they become thinner. Regulation of the flow of the petroleum is importaut, that a constant quantity may always be in the boiler. Ahout a thousandth part of the volume of feed water usually suffices for the amount of petroleum, which may be allowed to flow in with the water either continuously or periodically. For this purpose it is best to have an automatic arrangement to regulate the flow. The effect of the petroleum is to impregnate the solid particles in the water so that they circulate around without settling upon the bottom, and generally do not form a sediment that adheres to the wall, hut merely a scum, which must be removed from time to time.—*Bericht des galizischen Landespetroleumvereins.*

Publications Received.

"*Speech of Hon. S. M. White of California on the Maritime Canal Company of Nicaragua,*" recently delivered in the U. S. Senate, devoted to demonstrating the practicahility and commercial necessity of building that waterway under American auspices. One of the most interesting parts of Senator White's address is the evidence he adduces regarding the value of creosoted timber in preserving piles from the ravages of the teredo.

"*Catalogue of the Michigan Mining School,*" published by the Mining School, located at Houghton, Mich., a compendium of information regarding that institution; 214 pages descriptive of every department of one of the foremost mining schools in the country. In the reading room of this institution are to be found 224 of the leading scientific and educational publications of tbe world.

"*Sketches of Wonderland,*" an illustrated pamphlet dcscriptive of the country traversed hy the Northern Pacific Railroad. Smalley and others have had so much ahout tbat region that the first idea is the handsome appearing hrochure is only a re-hash of what has formerly appeared, hut examination shows this to be original throughout, superbly illustrated and fairly stated. What is new is good, and much that is good is new. The company has finally and sensihly quit trying to dub Washington's greatest mountain "Tacoma," and taken to calling it Ranier. An ascent of that famous peak is finely described, and Yellowstone Park for the one hundredth time is given great prominence. The book is the handsomest and most deserving tbing seen in railroad literature for the past two years, and any one caring to read it can get a copy by sending tbree two-cent stamps to Chas. S. Fee, Gen. Pass. and Ticket Ag't N. P. R. R., St. Paul, Minn.

"*Elasticity a Mode of Motion, Being a Popular Description of a New and Important Discovery in Science,*" is the title of a work of 61 pages by Roh't Stevenson, C. E., M. E., etc., who alleges therein his cognizance of the true cause of gravitation, and announces his new kinetic theory relative thereto. The work is finely printed on excellent paper and is for sale by the San Francisco News Co.; price 50 cents.

A Nevada Suggestion.

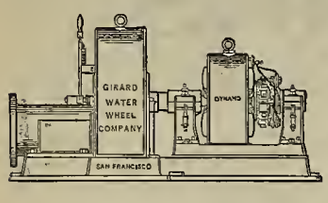
The Independence mine, Cripple Creek, Colorado, declared profits in 1895 as follows:

January	$159,000
February	105,000
March	130,000

Making for the first quarter in 1895, $364,000. The number of men employed is 28, four of whom are stoping. A simple calculatiou will show that it costs less than 60 cents to produce an ounce of gold from this mine. If the cheapness of production, as urged by the opponents of silver, from such mines as the Mollie Gibson and the Granite Mountain, is a reason for the demonetization of silver, why not demonetize gold ?—White Pine News.

TEMPERING in a bath of lead is employed especially for the very hard steels that crack if water or oil be used for that purpose. The process consists in heating the plate to be tempered uniformly to the temperature of 900° to 1000° C., and then plunging it in a hath of melted lead at 350° to 400°. The plate is left in the hath till its temperature is the same as that of the lead, perhaps 400°. Applied to the soft steels this process does not increase their hardness, but it improves them.

American Girard Water Wheel.



Adaptable to all heads between 30 feet and 2000 feet, particularly where economy in the use of water and fine regulation are desired, as, for instance, the operation of electric dynamos.

Girard Water Wheel Co.,

34 MAIN STREET, - - SAN FRANCISCO, CAL., U. S. A.

NEW SEAMLESS TUBE OLD LAPPED TUBE

SEAMLESS TUBE HOSE.

Our patented Seamless Tuhe Hose is the most valuahle improvement made in hose in recent years. In the old way the tuhe is formed from a sheet of ruhher, fifty feet long, of a width to encircle the hose pole, lapped and cemented (many times imperfectly), and the water gets through to the canvas and rots it, and the hose bursts. Our seamless tube is run the same as lead pipe is made and is free from defects. This process is employed in all sizes from one-half inch to the largest fire hose. Buy these goods and you are sure to get the worth of your money.

Simonds Saws

AND MACHINE KNIVES.

RUBBER BELTING

RUBBER HOSE, COTTON HOSE, PACKING.

LEATHER BELTING.

DODGE WOOD SPLIT PULLEYS.

EMERY WHEELS, FILES,

GRAPHITE and GRAPHITE GREASE.

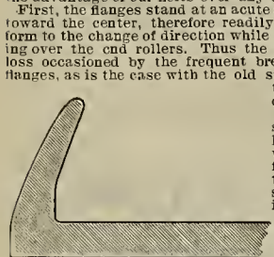
SIMONDS SAW CO.,

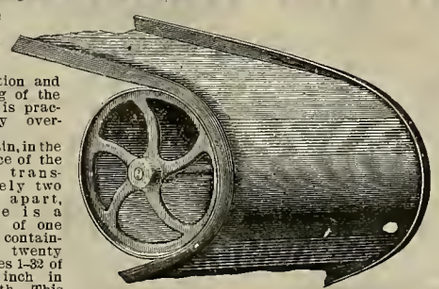
No. 31 Main St., San Francisco, and 85 First St., Portland, Or.

Blasdel Improved Concentrating Belt.

We keep in stock helts suitahle for the Frue, Triumph, Johnston and Tullock machines, and make all lengths and widths to order.

Practical mill men must see at a glance the advantage of our helts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.





Again, in the surface of the helt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from hanking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a helt with an entirely smooth surface.

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419 California Street, Haywards Building, ... San Francisco.

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Riveted Iron and Steel

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For Hydraulic Mining, Mills and Power Plants.

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309 to 317 Market Street, San Francisco.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XXVI

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1891, by Henry G. Hanks, F. G. S.

Sulphuretted hydrogen, known also as hydrosulphuric acid, may be recognized by its peculiar smell, like that of rotten eggs or bilge water. It is composed of the elements sulphur and hydrogen, as its name indicates, combined in chemical equivalents; its symbol is HS, and its atomic weight 17 by the old system, which is doubled in the new. Water at ordinary temperatures dissolves or absorbs three times its volume of this gas. The odor of the so-called "sulphur water" found in many parts of California is due to the presence of hydrosulphuric acid gas. In some localities it escapes in large quantities from the ground. The most noted in the State are the mud volcanoes or "salses" in the Colorado desert, San Diego county, the Sulphur Bank, Lake county; and Sulphur creek, Colusa county. Sulphur springs are common and numerous in different parts of the State.

Sulphur in active solfataras is supposed to result from the decomposition of two gases, hydrosulphuric acid (HS) and sulphurous acid (SO_2), thus ($2HS + SO_2 = 2HO + 3S$), or by the oxidation of hydrosulphuric acid gas, thus ($HS + O = HO + S$). The oxygen may be derived from decomposed water or by some secondary reaction. Both these gases are abundant at the mud volcanoes, at the Sulphur Bank and at Sulphur creek. Solfataric heat is not sufficient to sublime sulphur and it would seem that it must result from decomposition. The deposition of sulphur from hot alkaline sulphides at Sulphur creek may be seen at any time; all the tanks, pipes, conduits and bath tubs are whitened by a deposit of finely divided sulphur.

While sulphurous acid gas does sometimes leave the earth as such, its occurrence is very rare as compared with the other gases mentioned. It has so strong an affinity for hydrogen that it generally combines with it and becomes sulphuretted hydrogen. Sulphurous acid gas is, with but little doubt, the result of the decomposition of pyrites, a very ubiquitous and common mineral, so subject to change that if a sample after washing is simply dried on a water bath, the gas is distinctly evolved, and may be distinguished by its odor, that of burning sulphur.

Daubeny refers to the production of sulphur in the valley of "Vado Mortale," near Vesuvius, thus: "A vast accumulation of sulphur takes place in this valley, owing doubtless to the sulphuretted hydrogen, which is emitted in such quantities that it has been proposed to collect it for commerce, and petroleum has been likewise met with intermixed with the former combustible." (History of Active and Extinct Volcanoes, fol. 144.)

Sulphur is largely produced in Italy, mostly in Sicily, and, if I am not mistaken, it is all from solfataric deposits. The following, compiled from American and Italian statistics, will convey an idea of the magnitude of this industry:

YEARS.	Total production of Italy, tons.	Imported into the U. S., tons.
1881	323,151	102,771
1882	394,093	92,944
1883	391,689	92,861
1884	367,712	No returns.
1885	377,194	94,370
1886	326,657	112,283

At the Sulphur Bank quicksilver mine, in Lake county, sulphur was somewhat largely refined from the crude natural mineral during the years 1865 to 1868 inclusive. The total production was 941 tons, all of which, it is reasonable to suppose, was set free from hydrosulphuric acid gas in the manner described.

Carburetted hydrogen is a gas of quite a different nature from those above described. It is a true hydrocarbon, the elements carbon and hydrogen being combined in proportions to form a compound which is gaseous at ordinary temperatures. It is very light and inflammable; as soon as it is set free from the earth it rises, if not above the atmosphere, at least to an altitude near that position, and quite beyond our future observation. Its chemistry, physical properties, and history in California will be specially considered elsewhere.

California localities are numerous, but the quantity is small although important. That there has not been a gas excitement worthy of the name and that there are no great manufacturing centers here, depending on natural gas for fuel, is the best evidence that California gas emanations, whatever they may become in the future, are not to be compared with those of the Eastern States.

Natural inflammable gas is known to escape from the earth in the following counties: it may do so in others: 1, Alameda; 2, Amador; 3, Butte; 4, Colusa; 5, Contra Costa; 6, Fresno; 7, Humboldt; 8, Kern; 9, Lake; 10, Los Angeles; 11, Mendocino; 12, Merced; 13, Monterey; 14, Orange; 15, Sacramento; 16, San Joaquin; 17, San Luis Obispo; 18, San Mateo; 19, Santa Barbara; 20, Santa Clara; 21, Santa Cruz; 22, Sonoma; 23, Ventura; 24, Yuba; 25, Placer.

In describing the gas springs in the various counties, with the exception of Colusa, Contra Costa, Lake and San Joaquin, which I have personally examined, I have relied on newspaper accounts.

(To be continued.)

WANTED!

$2500—Wanted, a competent and honest quartz mill man, with above sum, to take half interest in custom quartz mill, permanent and desirable.

$5000—Wanted, a competent and honest quartz mill man (assayer preferred) to take interest in a custom quartz mill, chlorination works and a group of developed mines.

Both of these investments are safe and desirable, and invite investigation. For particulars, address

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YREKA, CAL.

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SEALED PROPOSALS

Will be received by the CITY OF SACRAMENTO, CALIFORNIA, until MAY 1, 1895, for furnishing and constructing

HIGH DUTY PUMPING ENGINES,

One (1) having a capacity of 5,000,000 gallons per twenty-four hours; the pump to be of the vertical triple expansion or cross-compound type.

The bid to include air pumps, valves, feed pumps, piping and all other appurtenances pertaining to a pumping plant, excepting boilers.

Steam-pipe connections must be made and furnished by contractor, also connections made and furnished to suction and mains.

The city to furnish concrete foundation for pump and build pump house.

Specifications may be obtained at the office of the City Clerk.

O. S. FLINT, City Clerk.

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Business College,
24 Post Street, - San Francisco.
FOR SEVENTY-FIVE DOLLARS

This College instructs in Shorthand, Type-Writing Bookkeeping, Telegraphy, Penmanship, Drawing, all the English branches, and everything pertaining to business, for full six months. We have sixteen teachers and give individual instruction to all our pupils.

A Department of Electrical Engineering
Has been established under a thoroughly qualified instructor. The course is thoroughly practical. Send for Circular. C. S. HALEY, Sec.

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PRODUCES A MORE PERFECT CUBIFORM MATERIAL AND A GREATER QUANTITY IN A GIVEN TIME PER HORSE POWER USED THAN ANY OTHER CRUSHER ON EARTH.

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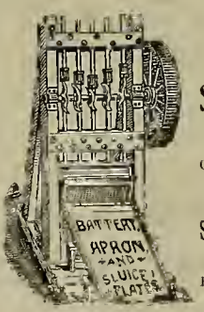
COATING.—We use great care in COATING our pipe with a HOT solution of Double Refined Asphaltum and Maltha.
COMPETITORS.—Our competitors say we have the best appointed Pipe Shop on the Coast.

SCHAW, INGRAM, BATCHER & CO., Hardware Merchants,
SACRAMENTO, CAL.



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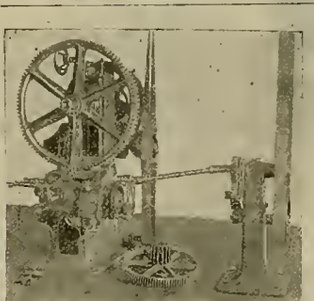

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A SPECIALTY.

Fine Work at Bedrock Rates.

SPUR, BEVEL, and WORM GEARS of any pitch or size up to 50 Inches.

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Experimental Machinery and Repair Work of all kinds.

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Thomas Price & Son,

Assay Office, Sampling Works

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Scientific Progress.

Interplanetary Communication.

Scientists who have beeu wedded to the theory that we shall one day be able to communicate between one planet and another, must regard the present trend of speculation and knowledge in the world of science with some complacency. It was announced some time ago that Mr. Lowell, the astronomer who conducted a series of investigations at Flagstaff, Arizona, observatory, on the canals and other features of Mars, had become convinced that the planet is inhabited by intelligent beings. His explanation of the "oases" connecting the "canals" is that they are fertile spots of an oval or circular shape, usually sbout 100 or 150 miles in diameter, and of green so dark that it is quite distinct in the telescope at the distance of 40,000,000 miles. He states that it changes with the season like that of the foliage of the earth. Following on these speculations, now comes Tesla's marvelous discovery that not only has the earth an electrical charge of its own, but that this charge can be demonstrated and utilized. This means that we have now at haud an inexhaustible source of power of which the whole world can avail itself; in other words, that every bit of machinery in operation on this earth can be actuated by electricity drawn from the earth itself. This discovery also opens out the way for transmitting intelligence all over the world without wires. But to astronomers the most iuteresting bearing of these new facts is that they render possible a system of communicating with the inhabitants of other worlds. If this earth has an electrical charge, and all the other heavenly bodies have the same, as undoubtedly they have, the first great difficulty in the problem of interplanetary communication has been overcome, and we have found a means of sending messages across chasms of space.

Improvements in Printing Machinery.

The American Sunday newspaper is the wonder of the Old World, and it would almost seem as if the enormous editions issued by some offices for the delectation of their Sunday readers had exhausted the possibilities of modern newspaper production. That such, however, is not the case, is evident from the constant succession of patents being taken out for improvement in newspaper printing machinery. The ingenuity and complication of some of these machines is remarkable. The specification of a machine for feeding sheets of paper to a printing press, occupied nearly eight pages of a recent number of the Patent Office Gazette, and contained not less than sixty-nine distinct claims.

An Auroral Search-Light.

An indication of the estimation in which the search-light is now held as a medium for the projection of light to distant points is recorded from England. An electrical journal says it is significant of the spread of electric apparatus, which were a few years ago regarded rather as curiosities, that the recent fine display of the Aurora Borealis in the uorth of England was by many people put down to the now more familiar beams of a search-light. It was only when, on comparing notes, it was found that the display had been seen in far distant places out of the range of any possible projector, that this very practical explanation was abandoned.

An Experiment with Water.

Take a pound of water, the temperature of which is 80° C. and mix it with a pound of water at 0°, or freezing point. The mixture will make two pounds of water, the temperature of which is 40° C.

Now take another pound of water at 80° C. and mix with it a pound of crushed ice—that is, ice crystals at 0° C., the same temperature as the cold water in the first mixture—and the result is that we have two pounds of water at freezing point.

In both cases the weight of matter at 0° C. introduced into the warm water was the same; but before the ice crystals could assume a liquid condition, they had to absorb a certain amount of heat. The heat was drawn from the warm water, and consequently reduced its temperature, but it did not raise the temperature of the ice. It simply acted as energy in enabling the ice to become liquid, and remained in that liquid in the form of latent heat, to be given up again as soon as the water resumed a crystalline form.—London Knowledge.

Cost of Stopping a Train.

A locomotive engineer talking on the above subject says: "It is not generally kuown what loss of power is involved in the starting and stopping of an ordinary train of cars. There is required about twice as much power to stop a train as to start one, the loss of power depending upon the momentum. A train going at the rate of sixty miles an hour can, by means of the Westinghouse air brake, be stopped within 120 yards from the first application of the brake. Now, enough power is lost to carry this same train fifteen miles over a plane surface. First, there is the momeutum acquired by the traiu flying at this remarkable rate of speed, theu the loss of steam in applying the brakes, aud lastly but not least, the extra amount of coal to compensate for all these losses. By computation I have ascertained that every complete stop involves a cost of $1.17."

A Novel Calculation.

According to M. Eiffel, the cost of lives of any great engineeriug work can be estimated, at least as accurately as the cost in money. "It has been found," he says, "by statistical observation that in engineeriug enterprises one man is killed for every 1,000,000 francs spent on the work. If you have to build a bridge at a cost of 100,000,000 francs, you know that you will kill 100 workmen." This statemeut, while rather an ingenious one, is not, it is stated, borne out by facts. Take the Eiffel tower, for example. Six and a half millions' worth cost only four lives. The Forth bridge, on the other hand, a contemporary points out, cost 45,000,000 francs, while the lives of fifty-five men were sacrificed in connection with its construction.

The Wilson

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—AND—
DIES.

Guaranteed to Wear Longer and Prove Cheaper than any others.

Made by use of Special Appliances.

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VAN DUZEN STEAM JET PUMPS

THE BEST IN THE WORLD.

Pumps any kind of Liquid. Always in order. Never clogs nor freezes. Fully Guaranteed. COST $7 AND UPWARD. Especially useful for Mines, Quarries, Pits, Wells, Clay Pits, Breweries, on Steamships, Ferryboats or any place where steam is available and liquid to be pumped. A full supply in stock. Address,

Jas. Linforth, 37 Market St., San Francisco.

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MANUFACTURERS OF

Stamp Mills, Ore Feeders

DETACHABLE BUCKET WIRE-ROPE TRAMWAYS,

Roller Grinding Pans, Desulphurizing Furnaces, Etc.

Improved Self-Contained Cushion-Frame Five-Stamp Mill.

The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The Term "Self-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

FIRST: There is Saved by the Use of This Mill a Large Bill for Heavy Timbers, in Many Instances Obtained at Great Expense and Loss Of Time.

SECOND: The Saving in Mill-Wright and Mechanics' Labor in Framing and Erecting.

THIRD: The Large Amount of Space Saved.

Send for Catalogue and Price List.

CORRESPONDENCE SOLICITED.

Mining Machinery.

STAMP BATTERIES.

Corliss and Meyer Cut-off

Steam Engines.

—Improved—

Blake Rock Breakers.

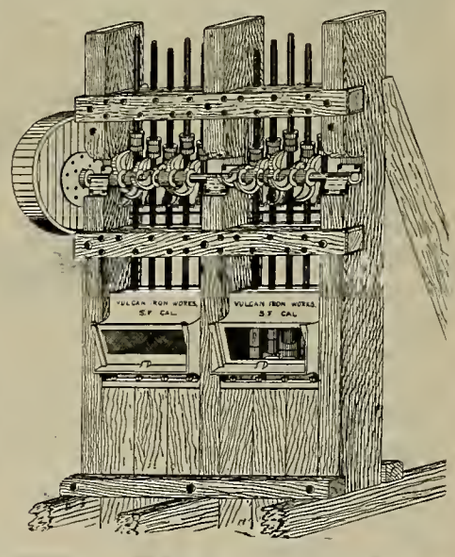
Amalgamating Pans and Settlers.

CHLORINATION BARRELS.

BRUCKNER ROASTING CYLINDERS.

— VULCAN —

WIRE ROPEWAYS.



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Rand Drill Co.

Rock Drilling, Air Compressing, Mining and Quarrying Machinery.

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Mechanical Progress.

Bell's Great Rival.

The biggest combination of capital and political influence ever gotten together has been organized to enter the telephone field and rout the Bell Company by giving cheaper, and, it is declared, better telephones.

The new enterprise is backed by the Sugar Trust, the Standard Oil Company, the Crocker interests of this State, and the Pullman Company interests. It has also among the men who are on the "ground floor" some of the shrewdest capitalists of every city in the Union.

Parallel with its line of capitalists is a line of politicians, who rank among politicians in the same fashion that the capitalists do among moneyed men. Among these are James S. Clarkson, of Iowa; John W. Candler, of Boston, Mass.; Colonel Conger, of Ohio; Representative Cannon, of Utah, the head of the Mormon Church; Louis Windmuller, of New York; Franklin Fairbanks, formerly Governor of Vermont; General Felix Agnus, of Baltimore, Md.; Charles A. Pillsbury, of Minneapolis, Minn.; and in Illinois W. J. Campbell, who also represents the Standard Oil interests; John S. Runnells, who also represents the Pullman interests, W. W. Tracy, of Springfield, Ohio, and two or three San Francisco men.

The entire country has been parcelled out and placed in the hands of local companies, each of which is organized along the double lines of capital and influence. The aggregate capital involved is $360,000,000. The amount of political influence is hardly calculable. It is safe to say, however, that it is enough to make any desired friendly legislation a great deal easier to obtain than it otherwise would be, and to make hostile legislation a great deal harder.

The company is named the Standard Telephone Company of New York. The electrical devices to be used are those of Allen T. Nye, who ten years ago made a long fight on the original patent covering the transmission of speech by means of a wire. He was unsuccessful then, but the expiration of that patent, about a year ago, gave him the benefit of what he tried to gain by litigation.

The company proposes to put in telephones at a uniform price of $25 a year, and make what is now a luxury within the means of comparatively few persons a necessity within the means of the great body of the public. The devices are already in use in New York City and State, and in New England.

Not the least remarkable feature about this gigantic combination is the secrecy with which operations have been conducted. This is the first intimation many will have of the plans of the company. It is doubtful if the Bell Company, with all its immense interests threatened, knows much, if anything, about what has been done by its rival in the actual operation of telephone lines.

The Standard Telephone Company is the parent organization, and there are nine local companies east of the Mississippi and ten in process of organization to cover the remainder of the territory in the United States, Canada and Mexico.

The Standard Company has a capital of $10,000,000, and offices at No. 68 Broad street, New York. Its board of directors is made up of Thurlow Weed Barnes, president; John A. Brill, president of the J. G. Brill Company, car builders of Philadelphia, Pa.; Carl F. Baker, of the hardware, steel and iron house of H. Baker & Co., of New York; John W. Candler, formerly Representative, railroad president and merchant, of Boston, Mass.; George Crocker, of this city; Henry Merz, president of the Heller-Merz Company, manufacturers of colors, of New York; Allen T. Nye, promoter of the company; Manning C. Palmer, president of the Syracuse National Bank and Electric Light Company, of Syracuse, N. Y.; Felix Rakeman, of Bulch & Rakeman, of Boston; John E. Searles, secretary and treasurer of the American Sugar Refining Company, better known as the Sugar Trust, of New York; Charles T. Strauss, of Charles T. Strauss & Brothers, importers of lace, of New York; and Louis Windmuller, of Windmuller & Roelker, of New York.

The State companies which have already been formed to operate as licensees of the parent company are the New York Standard Telephone Company, capital $6,000,000, to operate in the State of New York; Eastern Standard Telephone Company, Boston, capital $6,000,000, to operate throughout New England; New Jersey Standard Telephone Company, capital $3,000,000, Jersey City, to operate in New Jersey and Delaware; Pennsylvania Standard Telephone Company, Philadelphia, capital $5,000,000, to operate in Pennsylvania; Columbia Standard Telephone Company, Washington, D. C., Baltimore and Richmond, capital stock $4,000,000, to operate in Maryland, District of Columbia, Virginia and West Virginia; Ohio and Indiana Standard Telephone Company, Cleveland, Cincinnati and Indianapolis, to operate in Ohio and Indiana; Michigan Standard Telephone Company, Detroit, capital $4,000,000, to operate in Michigan; Northwestern Standard Telephone Company, Chicago, Davenport and Milwaukee, capital $6,000,000, to operate in Illinois, Iowa and Wisconsin; Northern Standard Telephone Company, St. Paul, Minneapolis and Pierre, capital $4,000,000, to operate in Minnesota, North and South Dakota.

The Central Standard Company, St. Louis, Kansas City and Lincoln, capital $5,000,000, to operate in Missouri, Kansas, Nebraska and Arkansas, is in process of organization, the promoter being Griffith Coit, president of the Union Trust Company, of St. Louis. The organization of the Mountain Standard Telephone Company, in Denver, Albuquerque and Salt Lake City, capital $4,000,000, to operate in Colorado, New Mexico, Utah and Arizona, is in the hands of George Q. Cannon, the head of the Mormon Church.

The local operating companies whose organization is not yet completed are: Southern Standard Telephone Company, Nashville, Louisville and Charleston, capital $4,000,000, to operate in Tennessee, Kentucky, and North and South Carolina; Gulf States Standard Telephone Company, New Orleans, Atlanta and St. Augustine, capital $5,000,000, to operate in Georgia, Florida, Alabama, Louisiana and Mississippi; Texas Standard Telephone Company, Austin, Galveston and Guthrie, capital $4,000,000, to operate in Texas, Indian Territory and Oklahoma.

Pacific Standard Telephone Company, Portland, Tacoma and Helena, capital $5,000,000, to operate in Washington, Oregon, Montana, Idaho, Wyoming and Alaska; California Standard Telephone Company, San Francisco, capital $4,000,000, to operate in California and Nevada; Intercolonial Standard Telephone Company, Quebec, St. Johns and Halifax, capital $2,000,000, to operate in all British territory east of the Province of Ontario; Canadian Standard Telephone Company, Montreal and Ottawa, capital $2,000,000, to operate in the Province of Ontario; British Columbian Standard Telephone Company, Vancouver and Victoria, capital $2,000,000, to operate in the British provinces west of Ontario; Mexican Standard Telephone Company, Mexico, capital $2,000,000, to operate in Mexico.

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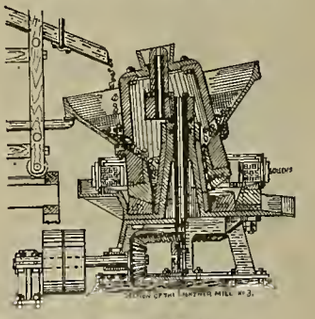
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Butte.

AROUND FORBESTOWN.—The Golden Queen mill has resumed work. The company have been taking ore out of the Honeycomb for two or three months past.

AT HURLETON.—D. A. MacDonald, who has been superintending operations at the Pactolian, is here to buy machinery for further development of the mine.

THE DUTCH RAVINE MINE.—*Times*: L. A. Russell has bonded the Dutch Ravine mine, and is making preparations to begin work on it soon. This mine was opened some years since by Harry Stow and others and about $15,000 was spent in sinking a double compartment shaft down 150 feet and in building tunnels and drifts, of which there are about 350 feet. The ore assayed high and the ledge run from five to nine feet in width; but Stow was engaged in the Gold Bank tunnel scheme, and not having time to attend to both, the Dutch Ravine was bonded to Mr. Russell. This mine is near Hurlcton and is considered one of the best prospects in the country. It is in a good location and should give employment to a considerable number of men. The ravine in which the ledge was discovered was extremely rich in placer gold in early days.

AT CHEROKEE.—It is expected that as soon as the litigation over the Spring Valley mine at Cherokee is settled, which will probably be in a short time, the mine will be started and worked by means of drifting. This mine has always paid handsomely, but the injunction against hydraulic mining forced the mine into expending large sums of money, and eventually to be involved with its creditors. These matters being now adjusted, it is expected operations on a large scale will commence before long.

The ledge of the Big Betsy, in the Mooretown district, has been struck at a depth of 140 feet. The tunnel was in 175 feet, and work had been in progress some six months.

Calaveras.

THE TULLOCH MINE.—*Echo*: The Tulloch mine, situated in Albany Flat mining district, has, during the week, been put under agreement of sale within sixty days to M. Shaughnessy, of Salt Lake, Utah. If the party of the second part agrees to accept the property at the expiration of the sixty days, the mine will be transferred and a deed issued to Mr. Shaughnessy upon the payment of $50,000 cash in hand. The mine is not under bond and will not pass into the hands of any one until the sum of $50,000 is paid down. Mr. Tulloch is working the claim pending the consummation of the sixty-day proposition.

Nevada.

TULLYS' HYDRAULIC MINE.—*Transcript*: N. and J. B. Tully will start up their hydraulic mine, in the vicinity of Omega. They are building the necessary dam to restrain the debris from the mine before a permit from the U. S. Debris Commission can be obtained, and have chosen Scotchman's creek for the location of their dam, which is now about two-thirds finished. The dam will be 290 feet in length, 65 feet high, and the base of the supporting wall will be 120 feet in thickness.

A GOOD MOVE.—*Herald*: George Senn, superintendent of the Gracie mine, on Gold Flat, has made arrangements for the purchase of the mill, hoisting machinery and chlorination works of the Delhi mine, ou Columbia Hill. The entire plant will be removed to the Gracie and there utilized in working the ore from that mine. Mr. Senn represents an aggregation of strong capitalists, and has a bond on several other mines at Gold Flat. There is every reason to believe that extensive operations will be undertaken by the company. A boarding-house is now being erected near the Gracie mine.

WASHINGTON DISTRICT.—*Transcript*: The Oak Tree mine is extending the drift south on the 800 level, and have struck a good ledge of ore. Twenty-five men are at work, most of them stoping. In the stope the ledge is twelve feet in width. The mill is kept busy crushing the ore.

At the Blue Jay mine some excellent ore is being extracted from the stopes. Besides free gold the rock contains a large percentage of sulphurets that will yield about $80 per ton, and to save these the owners of the mine are putting up a canvas plant.

Messrs. Baugh, Bonuey and Heihergar will commence shortly to open up the Virginia mine. They iutend to run a drift on the ledge, which is about four feet in width, as shown by the prospecting already done. Tests made of samples of the ore lead the owners to believe that they have a very good mine.

In spite of the rumors of the resumption of operations at the Yuba mine, everything there is quiet—nothing having been doue as yet.

Several venturesome prospectors who, no douht, believe in the maxim "the early hird catches the worm," have already gone to work in the Fall creek country, though the snow is still from ten to twenty feet in depth.

The new pump at the Culhertson mine is working satisfactorily and handles all the water. Since the resumption of work a hody of ore has been struck that excels in quality even the rich rock heretofore obtained. The extent of the new find has not as yet been fully determined.

A 1700-foot tunnel is heing run by the Eric Mining Company, which will connect the Erie with the Duhlin Bay mine. The two mines are situated about half way between Gaston Ridge and Emeka.

San Bernardino.

THE DESERT QUEEN.—The latest reliable information, says the Banning *Herald*, in regard to the Desert Queen mine is to the effect that the seven tons of ore which have been milled yielded ninety-seven ounces of gold, which, at $17 per ounce, amounts to near $1700. This is an average of $240 per ton. James McHenry, of this mine, lately sent out a five-stamp mill. He reports the ledge in the Desert Queen a large one.

VANDERBILT DISTRICT.—The reports from Vanderhilt district are encouraging. The Gold Bronze mine is in good shape. On the 250-foot level there is 200 feet of ore in sight which runs up to the 150-foot level, the intervening distance heing nearly a solid block of ore. There is also good ore heing stoped out of the 150-foot level. A carload of concentrates was lately shipped from this mine to Pueblo. These concentrates are valued at ahout $60 to the ton. At present there are twenty-three men at work.

San Diego.

REDUCTION WORKS RESUMED.—The National City *Record* says that progress at the reduction works the past week has heen marked. The dry kiln is being lined with fire brick and the chimney for the kilu has been put up. The stamp mill, it is said, will begiu operations the first of this week. A steam siphon is to be used in draining the surplus water from the tailings, the water to he run off into the outside slough. It has been estimated that there are some 5000 tons of the tailings to he worked and ahout thirty tons a day will be run.

Shasta.

THE EUREKA TELLURIUM.—TO THE EDITOR: The new machinery at the Eureka Tellurium mine is heing put up at Middle Creek, Shasta Co. The wages paid to miners, machinists, engineers, etc., is $1.25 per day; board, $5 per week, to be paid from the wages.

GEO. E. MILLS.

GOLD DUST.—The *Free Press* is informed by the McCormick Saeltzer Company that since the first of January this corporation has shipped gold dust to the value of $1000 per week. Last year they shipped over $40,000. W. W. Williams shipped last week $600 in dust, and no later than Monday $300. Of course other firms ship some, hesides what is sent direct to the Mint through Wells, Fargo & Co. This does not mean amalgam, hut gold taken out of the placer mines and the river.

MINE BONDED.—E. P. Connor says that he has honded five claims on Salt creek to C. A. Hascall, late of Milwaukee, for $10,000. The bond is to run for a year. The company Mr. Hascall represents is to put up a mill, and Connor is to be paid from the net proceeds resulting until the sum agreed upon is paid over.

SOME RICH ORE.—C. W. Frost of Santa Rosa received a hag of specimen ore from a Shasta county mine last Thursday, which gave an average assay of $521.80 per ton in gold. He will erect a ten-stamp mill on the property. This will render the crushing of the ore very simple, as the mill can he operated by water power.

Siskiyou.

GENERAL MINING NOTES.—*Journal*: Messrs. Mullen & Kingshury, at the Spencer mine, on south side of the Siskiyons in Cottonwood district, are preparing to do placer work helow their quartz claim to gather up some of the stray nuggets that are certain to have washed down from the rich ledge above. They will get iron from the city and run a hydraulic.

Hippler & Roberts have sold their prospect claim in Humbug district to Tehhe and Davis for $500.

T. Franklin aud N. Lamh have bought the five-stamp mill of Cleland, at Barkhouse.

At Cherry Creek, Barnes & Co. are crushing about fifty tons ore with their two arrastras.

The Espey Mining Company have acquired an interest in the mines on Horse creek, and will put fifty meu at work digging a ditch that will carry 1000 miner's inches of water, and long enough to get 300 feet pressure. Horse creek has its source in the Siskiyous and is one of the trihutaries of the Klamath river. In March, 1894, an old channel was discovered ahout 100 feet above the present creek level. Considerable development work has since been done with results satisfactory euough to warrant the ahove undertaking.

This has been the most favorable spring in many years for river mining, and from the mouth of Cottonwood creek to the mouth of Scott river, (the river-mining section of the Klamath), many wheels may be seeu turning and hundreds of lahorers putting in wheels and wing dams and getting ready to take from the river heds and banks gold for which the Klamath river is famous.

The Eastlick Bros. and the Wright & Fletcher hydraulic elevators at Oro Fino are working at full hlast. The former have, owing to the favorahle spring, gotten a start of a month earlier than usual and expect hy July 4th to clean up $25,000.

There is some prospect of the Virginia Bar mine heing again put into operation. In the summer of 1888, a crowd of Kanaka miners took out $60,000. They afterward got off the pay, and since then no great effort has been made to find it.

The Klamath, Scott, Shasta, and Salmon rivers are running red with placer dirt.

In 1893 one-sixth of all the gold in the State received at the Mint, came from Siskiyou and Trinity counties.

Extensive mining operations are contemplated in the vicinity of Callahau's rauch, in the southern part of this county. Large tracts of old drifting ground has been acquired, and a long ditch is to he constructed bringing water from the south fork of Scott river and Jackson lake, and the property hydraulicked on an extensive scale. The enterprise is in charge of the same parties that brought water iu by an eleven mile ditch from Canyon creek to a 1300-aere tract uear Junction City in Trinity county, and sold the same when in operation to a French syndicate.

Work of digging the fifteen mile ditch to carry water from Clear creek to the Frazier diggings on the lower Klamath, is being pushed to completion.

Messrs. Songer and Dame of Ashland, Oregon, who have leased the McCoonell and and Quinn and Pacific mines on the Klamath river at the mouth of Humhug creek, have gotten them almost ready to commence operations. The former mine has in fourteen seasons produced $300,000 and but four of the forty acres have been worked.

J. M. Patterson, of Sawyer's Bars has purchased the six-foot ledge known as the Swede prospect, and expects to push work on and make some money out of his new claim. The Golden Everett mine has started up and also the mill. The Uncle Sam mine and mill are under full headway, and the mining outlook in general throughout that country never looked more promising, and the residents feel highly elated. The Corbin & Fitz mine is preparing to start soon, and there is talk of putting on thirty or forty men.

Trinity.

CENTER AND VICINITY. — *Journal*: The Trinity Gold Placer Syndicate have had twenty-two men employed all winter on their property on Coffee creek on very good gravel, taking out an avorage of $10 per day to the man. Last fall pipe was laid and other ditches cleaned out preparatory to sluicing in the spring. The company will employ forty or fifty men there this summer.

The Rainbow Company have opened a drifting claim on the old Henley claim on Coffee creek. They are getting out timhers and will push work rapidly as soon as the ground is sufficiently dry.

At Cinnabar, the Altoona Company have had sixty men at work all winter. A shaft has been sunk 135 feet helow the old workings and levels run from the bottom of the shaft, striking two large ore bodies, a ledge of hard cinnabar ore twenty feet in width, hoth very rich in quicksilver. Tunnels are being run and the property is being thoroughly developed. The furnaces are in operation and are turning out a stream of quicksilver. A defect in the flue of the furnace retarded the production of metal last winter, but that is now remedied and the furnace is run to its full capacity. The company will sink the main shaft deeper and show up the immense ore bodies of the mine. They have on the mine hoisting, sinking and pumping machinery to sink the shaft to a depth of 1000 feet. At the lntogral mine six men are at work prospecting and doing development work and taking out ore. More men will be put on soon and work will be pushed.

THE BROWN BEAR.—The Brown Bear Company have cut the ledge in the Monte Cristo in the lower crosscut from the lower tunnel—ahout 100 feet lower than the mill. The ledge is four or five feet wide, rich in free gold and sulphurets.

Tuolumne.

THE SOULSBY MINE.—E. H. Schaeffle has interested Michigan lumber capitalists in the famous old Soulsby mine of Tuolumne county. Their superintendent, Mr. Alvin Lundherg, with his engineer, Mr. Roth, are now on the mine arranging for its reopening. Tho Soulsby Cons., when in operation, was the leading mine of the county and yielded about three million dollars from its fifteen-inch vein of thirty-five-dollar ore. The mine was then a steady yielder of large dividends. With the improvements that have since followed in the methods and machinery for mining and milling, coupled with the great reductions in the cost of all operating expenses, and with four thousand feet of virgin ground to operate in, the mine should now excel its former record. Thus, one after another, the famous old mines are heing reopened—first the abandoned Kennedy, which is to-day the leading mine of Amador county; then the Utica of Calaveras, now the banner gold mine of the United States; then tbe Rawhide of Tuolumne, now producing the richest ore of any mine in the State; next the Hite of Mariposa, Gwin of Calaveras and now the old Soulsby of Tuolumne. All that any of these mines wanted was depth, which has brought them into honanza, and with modern mining and milling methods made the mines, that are now fully equipped and developed, the largest dividend producers of the State.

THE JUMPER MINE.— *Independent:* A rich strike was made on the mother lode at the above mine, at Chilli Hill, last week. From the result of one hlast, in the No. 1 level, $3000 was dislodged and daily exceedingly rich ore is coming to grass. The body of ore that produces this rock is carried eleven feet wide, hut it is believed the ore body is much larger, which will be so found when more fully explored. Judging from the surface indications, the pay helt will be found twenty or more feet wide, being in hlack mineral slate formation. The last cleanup from their new ten-stamp mill yielded $12.50 per ton. A good deal of the rock sent to the mill was considered as waste. The result surpassed the owners' most sauguine expectations. None of the rich rock has been treated as yet, of which there is a considerable quantity on hand that will mill $20,000 per ton.

NEVADA.

STOREY COUNTY.

The following official reports have been placed on file in their respective offices:

CHALLENGE.—From the surface tunnel the joint Confidence and Challenge raise is up 63 feet; the top is in quartz of no value.

CROWN POINT.—The south drift from the raise on the 700-foot level was extended to a total length of 20 feet and counected with the fourth floor north drift. Work was resumed in the raise from the east crosscut from the south lateral drift on the 700-foot level, and it is now up 40 feet. The top is in a mixture of porphyry, clay and seams of quartz. Have been engaged in retimbering and repairing the south drift from the east crosscut on the 700-foot level and have completed 37 feet. During the week have shipped to the Mexican mill 670 tons of ore which was extracted from the openings hetween the 600 and 700 foot levels and from above the 600-foot level. The average hattery for the week was $10.48, of which $9.35 was gold.

BELCHER.—On the 300-foot level the joint Belcher and Seg. Belcher south drift is in 166 feet from the shaft; the face shows porphyry. Have hoisted during the week forty-five tons of ore, the average top-car sample of which was $16 29 per ton. Have also shipped to the Brunswick mill for reduction 301 tons of ore.

SEG. BELCHER.—On the 200 foot level the southwest crosscut from the south lateral drift is out sixteen feet; the face shows porphyry and quartz of no value. Have hoistcd during the week and stored in the orehouse at the mine twelve tons of ore, the average car-sample of which shows an assay value of $34 46 per ton.

JUSTICE.—The north prospecting drift from the hottom of the Blaine winze, intermediate tunnel level, was advanced ten feet. On the drain tunnel level, between No. 1 and No. 2 chutes, they are sinking a winze in the ore mentioned in the last weekly report. This winze is now down 12 feet in fair-grade ore.

SAVAGE.—On the 950-foot level the north lateral drift, started from the west side of station, is advanced 25 feet in the vein. The east crosscut, started from the south drift 40 feet back from the 13th-floor upraise, was advanced 25 feet when it reached the last clay of the ledge and was discontinued. The north drift, started from the east crosscut, fourth floor of north upraise, is advanced 24 feet; face is in quartz and porphyry. The south drift from the face of the sill floor, southeast drift, was advanced 20 feet; total length, 100 feet; face in quartz, giving low assays. On the 1000-foot level they are extracting some ore on the 8th floor of the old stopes. On the 1050-foot level the east crosscut, started on the fourth floor, 300 feet south of the shaft, is advanced 25 feet; face is in quartz, giving low assays. Have started a west crosscut from the tenth floor of the south ore slopes, and advanced some ten feet in quartz.

LANDER COUNTY.

AUSTIN MILL TO START.—P. L. Farusworth says the mines are in a flourishing condition. The ore produced is a free-milling silver ore—one of the cleanest and best milling ores in the State—and on this product the company's mill will start up next week.

ALASKA.

PRICES AND PROSPECTS.—Juneau *News*, April 4: A prospector's supply for one year in the Yukon country should consist of about the following, whereof comparative prices are given in the table below:

ARTICLES.	No. of Pounds.	Juneau Prices.	Forty Mile Prices.	Total cost Juneau.	Total cost Forty Mile.
Flour	450	2	$ 08	$9 00	$36 00
Sugar, D. G.	75	5½	20	4 13	15 00
Bacon, side	75	10	35	7 50	26 25
Bacon, breakfast	25	13	50	3 20	12 50
Beans	75	3½	10	2 62	7 50
Dried Apples	25	10	20	2 50	5 00
" Peaches	25	10	30	2 50	7 50
" Apricots	25	10	30	2 50	7 50
" Prunes	25	10	30	2 50	7 50
Raisins	25	10	25	2 00	5 00
Split Peas	25	8	15	2 00	3 75
Coffee, ground	10	25	40	2 50	4 00
" green	5	50	50	1 50	2 50
Tea, common	10	35	75	3 50	7 50
Baking Powder	12	50	1 00	6 00	12 00
Condensed milk, ½ case	30	....	....	8 37	10 00
Corned Beef, 1 case	28	....	....	2 75	6 00
Cornmeal	10	3½	15	35	1 50
Rolled Oats	10	5	15	50	1 50
Oatmeal	10	5	15	50	1 50
Rice	35	7½	15	2 62	5 25
Evaporated Potatoes	10	25	40	2 50	4 00
" Onions	5	50	1 00	2 50	5 00
Black Pepper, ground	2	50	1 00	1 00	2 00
Salt	15	10	10	37	1 50
Mustard, ground	1	40	1 00	40	1 00
Allspice "	½	25	50	25	50
Cinnamon "	½	50	75	38	75
Sage "	½	35	50	35	50
Butter, roll	15	40	1 00	6 00	15 00
Juneau Camp Stove	35	....	....	5 50	15 00
Gum Boots, C P	8	....	....	6 50	12 00
" canvas	6	....	....	3 50	10 00
Juneau Sleigh	20	....	....	8 00	16 00
	1,132			$107 70	$280 50

It will be remembered the above is a pretty comfortable and complete outfit, and might be cut down some; however, a prospector will find use for it all if he has it. In the line of dry goods and clothing add 75 to 125 per cent, and you approximate Forty Mile prices.

And now a few reasons why all who come in should either bring a complete outfit with them or cash to huy the same on landing here. There are only two companies doing business in the way of transporting goods to this country; that is to say, from St. Michaels, at the mouth of the Yukon, to Pelly river, a distance of 1700 or 1800 miles. The Alaska Commercial Company runs the steamer Arctic, whieh carries about 100 tons of freight and is supposed to make three or four trips a season and to land enough goods to supply her traders with all the merchandise their customers require, hut they often run short. The Arctic made three trips last summer, hut the fourth she failed to get here. This was truly unfortunate for Messrs. McQuestou & O'Brien, Harper & Ladeau and Harper, the Commercial Company's traders. The Arctic had on hoard 2000 sacks of flour and a proportionate quantity of other supplies, all of which she landed at Fort Yukon, within the Artic circle, about 300 miles, by the river, below Forty Mile and ahout 80 miles below Circle City. Last fall between the two trading companies some prospectors got their full supply for the year, but there were more who secured only a partial outfit—

in fact many were cut down to 100 pounds of flour and some hard tack, with a few pounds of other provisions. This will put the camp back one year, no doubt.

No one should think of coming here unless he is a strong, ambitious and energetic man, willing to work hard and undergo many hardships, privations and disappointments without becoming discouraged. There is much hard work to be done by the prospector, such as poling his boat up rivers and creeks to the nearest point to the locality where he intends to work or prospect, and from the landing he may have to pack through swamps and over mountains from ten to fifty miles, fighting and battling more mosquitos, black gnats and black bugs than he ever saw; unless he has been here before.

Prospectors and miners who have been in here one season avoid much hardship by sleighing their goods in winter time by dog teams or pulling their sleighs themselves. Freighters who run dog teams charge ten cents per pound from Forty Mile to Franklin Gulch, 85 miles up Forty Mile river, and the same price to Miller or Glacier creek, on the head of Sixty Mile creek, 60 or 70 miles distant. To have goods packed to these places in the summer time costs from 30 to 40 cents per pound. The additional price is owing to rough trails through marshes, over divides, crossing creeks, etc.

Gold has been found on the bars of the Hootalinqua, a distance of 150 miles above its mouth, but not in paying quantities. At the head of the river there are some large lakes and the country is flat and marshy. The river is large and the water runs swift, making it hard work to pole up. The Little and Big Salmon rivers have been prospected along the bars and some gold taken out.

William Ebner has sold to the Seattle & Alaska Mining and Milling Company the Tennessee and Lindig mines in St. James Bay district for 30,000 shares of stock in same and $2500 cash.

ARIZONA.

KING SOLOMON.—Reports from the King Solomon district, ten miles east of El Dorado, Ariz., are to the effect that the veins lately uncovered there indicate a low grade of porphyry and iron formation, showing, by assays, from $2 to $16 per ton in gold. Some are of the opinion that the ore, of which, as reported, there is an immense quantity, can be milled in the mountains, while others contend it will have to be brought to the river. Franconia, on the Atlantic and Pacific, is the nearest station, being about seven miles from the district.

SILVER KING.—News from the Silver King, says the Florence *Tribune*, is encouraging. The recent report of a rich strike on the 400-foot level seems to have a good foundation. It is said that native silver, similar to that which made the mine famous, has again been encountered in a large body. Arrangements to work the mine on an extensive scale are contemplated.

THE ARICA GROUP.—*Miner:* A. M. Wells of Denver, as agent for a wealthy syndicate of New York and Denver, has closed a deal with E. H. Hiller and C. H. Gray whereby these gentlemen convey to the syndicate the group of gold mines known as the Arica group. The syndicate will begin the work of developing the mines at once by building a railroad from the mines to the Colorado river and operate a steamer on the river. A twenty-five stamp mill will be erected at the mine, and with a large force of men and plenty of money to back the enterprise these mines may be expected to add much to the output of gold in the Territory for the future.

BRITISH COLUMBIA.

FAIRVIEW.—The Oro Denard mine has been bonded by W. T. Thompson for $30,000. This is one of the largest copper claims on the continent, having a width of 600 or 700 feet on the surface.

The Lead King mine has been bonded to Symonds & Wallace.

TRAIL CREEK ORE.—The Trail creek ore is dumped into wagons when it leaves the mine, without being sacked or sorted, says the Rossland *Miner*. In this respect it differs from the high-grade lead ores of the Slocan and from the copper-silver ore of Toad mountain, which are both carefully sorted before they are shipped. The ore is then transported to Northport, where direct connection is made from the wagon to the car, or to Trail, where a transfer by steamboat down the river is necessary. The road to Northport is fifteen miles long; that to Trail is short seven, but the transfer adds an extra dollar to the cost of shipment, and other things being even, all the ore would go by Northport. But other things are not even, for the Northport road is in very bad shape, and will remain bad till the spring rains are over. It does not pay teams to haul ore now, unless they have freight to bring back.

The ore is then shipped by rail to the smelter. Most of it hitherto has gone either to the Montana Sampling and Refining Works at Great Falls, or to the Tacoma smelter. Because of its excess of iron, which amounts to about 25%, the ore is exceedingly valuable to the smelters as a flux, and as it saves them buying iron ore they are willing to pay a premium for it. Before the ore can be smelted the sulphur has to be roasted out of it, and after roasting it is mixed with silver ores and smelted.

COLORADO.

PARK COUNTY.

Alma districts have eight mills and concentrating plants, and one sampling works, with plenty of milling and shipping ore in sight, says the Park County *Bulletin*. Most of the largest bodies of ore are gold bearing, while others are rich in silver and carry a small percentage of gold, with heavy percentages of lead and iron. Smelters are treating some of the Alma ores now free, and others at as low a rate as $1.50 per ton, and, with the low freight rates, what more could be asked or expected for a boom starter.

IDAHO.

THE TIGER.—*Miner:* They are building a new ore bin which will hold about 500 tons, sufficient for a several days' run of the concentrator. The Tiger is now employing sixty-five men all told.

THE GEM.—The shaft at the Gem mine has been sunk to a depth of 100 feet below the first level from the tunnel, or 235 feet below the tunnel level. There a crosscut will be run to the lode.

THE POORMAN.—The Poorman has about 180 men on its payroll. The monthly disbursement is about $20,000.

The continued operation of the mines at Burke, when a number of the leading mines throughout the country have been obliged to close on account of low prices of the metals, is presumptive evidence of the great value of the mines.

RECLAIMING AMALGAM.—A Scotch company is putting in a big bedrock flume on Bear creek, near Rocky bar. The flume has already been built a considerable distance, and its construction has developed a most interesting fact, but not an unexpected one. In the early days there was a number of arrastras and quartz mills in operation on the creek above the point where work on the flume is now being done. Large quantities of amalgam had been allowed to escape into the creek, and it was thought enough could be secured by means of a flume to make the enterprise remunerative, even though no other gold were discovered. Already considerable amalgam has been taken out, and the flume is still two miles below the point where most of the mills and arrastras were located. It is estimated there is at least 250,000 pounds of amalgam in the creek that can be saved by means of the flume. Every 100 pounds of the amalgam contains about five pounds of gold, or about $1250.

MONTANA.

PIPESTONE DISTRICT.—The Columbia mine, in the Pipestone district, is sold, says the *Zephyr*, to C. E. Van Zandt, of Butte, for $20,000. Stamps will soon be dropping on the Columbia ore.

BOSTON & MONTANA.—It is thought that the next dividend on Boston & Montana stock will be $2 per share, payable in May. The rise in the price of silver is a good thing for the Montana and the Butte mines, as they produce a large amount of the white metal. The Montana produces about 15,000 ounces monthly and the Butte 90,000 ounces. Each advance of one cent in price of silver means a much larger revenue for those two companies without any additional expense. With silver at 67 cents, the Butte's income from its silver must be $700,000 per annum, which is equivalent to $3.50 per share on the stock.

AT LUMP GULCH.—*Review:* A new kind of mineral known as molybdenite has been discovered in Lump gulch in the G. and P. mine, owned by Thomas Greenwood. This rare metal very much resembles antimony and occurs in short or tubular hexagonal prisms, and is valued at $58 per pound in Germany.

BOUGHT THE MCVEY PROPERTY.—Helena *Independent:* Charles D. McLure of the Bi-Metallic and Granite mines has purchased the McVey property, adjoining the Chili, situated at Sand creek, Granite county. This property runs about $109 in gold. The shaft is down about 300 feet. $12,000 was the amount reported for it.

NEW MEXICO.

GENERAL NOTES.—Cerillos *Rustler:* The machinery for increasing the daily capacity of the Fitzgerald test works at Golden is in place.

James M. Lucas, who has been running a stamp mill on the Fuerto for some eighteen months with very satisfactory results, made a cleanup last week. The proceeds of a fifteen-days' run were an even $1500. That is pretty good—$100 a day—with a small, cheap five-stamp mill.

New Mexican: There are now working in the Pinos Altos camp four quartz mills and one at Silver City working on Pinos Altos ore. There are about 200 men employed in the camp, all working on contract and making good wages. The men are breaking ore by the ton and driving drifts, etc., by the foot. The ores are not to say very high grade, but can be worked at a fair profit. The veins are true fissure veins, in granite and porphyry. At a depth of 600 feet the fissures are as well defined as at the surface.

NEW DRY-WASHER.—A New Mexico man has patented a dry-washer, designed to save all the gold, both flour and nuggets, in the sand without the use of water and quicksilver. It consists of a sand-roaster discharging into a nugget separating machine leading to conveyors connected by elevators with the uppermost of a series of screens one above the other, each having riffles to retain the gold and an outlet for the tailings. The screens are graduated and each has a hopper discharging into the next lower screen. The machine is run by a team attached to sweeps.

NORTH CAROLINA.

A Raleigh dispatch says: Gold miners from the West are arriving at Piedmont section of North Carolina and there is an outbreak of mining fever. The discovery of a nugget weighing eight pounds five ounces in Stanley county has increased interest in mining.

OREGON.

JACKSON AND JOSEPHINE COUNTIES.—Dysert & Miller are opening some promising placer mines on Jack's creek in Josephine county, which they expect to work on an extensive scale next season. They are building a ditch to carry water from Jump-off-Joe creek.

Dugan & Colvig have a small force at work developing their quartz ledge west of Jacksonville, which is getting richer and better defined. They are exhibiting some very fine ore.

Capt. Nash was at Althouse, Josephine county, last week, where he put a hydraulic plant into shape for the Rosoburg company which is operating in that section. They have a supply of water and plenty of ground.

The old channel in Humbug district, Applegate precinct, which was so rich in early days, has again been discovered by a miner named Poole, who has been drifting there for some time past. He has taken out about $1500 since he struck it.

CINNABAR MINE.—Ashland *Tidings:* The Minneapolis people, who had Hill's cinnabar mine on upper Wagner creek bonded, allowed the bond to lapse last month. Hill has since been running a new tunnel in on the ledge. The ore carries gold as well as quicksilver.

UTAH.

CENTENNIAL-EUREKA MILL.—It is more than likely, says the *Tribune*, that the prosperous Tintic district will have another big reduction plant before the season is over. The Centennial-Eureka Company has about decided to erect a concentrator, for the purpose of handling the large amount of concentrating ore that the mine is producing now. The mill will be of at least 100 tons capacity, but no definite plans have yet been decided upon.

The strike recently reported on the 1000 level of the Centennial-Eureka is not considered by local stockholders a matter of unusual importance. New bodies of high-grade ore are constantly being developed, they say, and have become quite an ordinary matter in this mine, which has become one of the great producers of the country. The regular monthly dividend of $1 per share was paid on Monday, $30,000 being distributed. The Centennial-Eureka is now the banner dividend-payer of Utah, but the Silver King and Bullion-Beck will give it a close race for first place before the year is ended.

WASHINGTON.

ON THE CHEWAHWAH.—Messrs. Wilson & Powers of Seattle have a force of ten men at work establishing hydraulic works with which to engage in placer mining on the Chewahwah and expect to be washing black sand in copious quantities by the 1st of June. It is asserted that from twenty to thirty good colors can be obtained in every pan.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from T. G. Phelps, in the Liberty Hill mine, Nevada Co., and John Spaulding, in the Polar Star mine, near Dutch Flat, Placer Co., to impound tailings behind the Liberty Hill dam, in Bear river; and from Ah Wing, in the St. Lawrence mine, near Moores Flat, Nevada Co., to impound tailings behind brush dam in Illinois canyon, gives notice that a meeting will be held at Room 92, Flood Building, San Francisco, Cal., on May 13, 1895, at 1:30 P. M.

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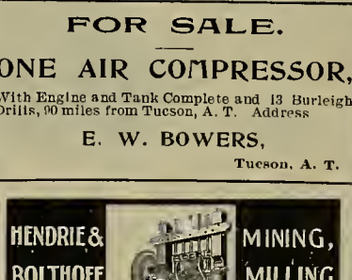

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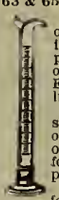

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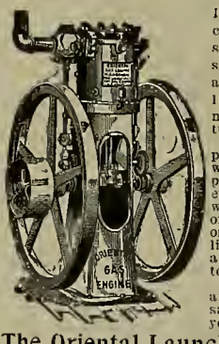

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Electrical Progress.

Tesla's Oscillator.

Countless are the directions in which Nikola Tesla has experimented, but there are four things with which, in the minds of people familiar with his labors, he is particularly identified. He has introduced an entirely new system into the operation of dynamos and motors by causing what is called the "magnetic field" to revolve and drag the armature along with it. This is an improvement of immense practical importance in the transmission and use of alternating currents for power purposes, and is alone sufficient to render him famous for generations. He has shown that alternating currents of tremendously high potentials may be handled with practical impunity under certain circumstances—an exceedingly brilliant achievement, although of less practical value than some others. Then he has very nearly, if not quite, solved the problem of producing electric light without heat—an object which numerous scientists have eagerly sought with little result so far, but which is highly desirable in the interests of economy, to say nothing of safety and beauty. Finally, he has invented a combination of steam engine and dynamo, called an "oscillator," which is designed greatly to simplify the mechanism necessary in generating electricity, and hence to revolutionize that art. Several specimens of this device, differing among themselves in form but not in principle, were publicly exhibited and explained by Mr. Tesla nearly two years ago. He has since improved it in detail, with a view to still greater simplicity and efficiency, and it is said that just before the fire which destroyed his laboratory, a few weeks ago, this invention had reached such a degree of perfection that it was ready for the commercial stage of its career. Although some of its less important features are still kept private, and while it is impossible yet to measure with accuracy the possibilities of its usefulness, the oscillator is just now attracting renewed attention and provoking much enthusiasm among electrical engineers.

The fundamental idea of this machine is that the coils of wire in which a current is excited are moved to and fro horizontally, instead of being whirled around by a rotating shaft. What electricians call the "field" is the area in front of the poles or pole pieces of a magnet. Out into that space there extend invisible "lines of force." If a piece of soft iron be moved transversely past these poles, and near them, cutting the lines of force, it is momentarily magnetized by induction; and in any coil of insulated copper wire surrounding it, there is induced, for the same brief instant, an electric impulse. In the ordinary dynamo a ring of soft iron is used instead of a bar, a number of connected coils are wound on it, and the whole "armature" is revolved between and in very close proximity to the field magnets; but Mr. Tesla winds his coils on a straight bar, and oscillates the latter between his magnets. By this change of method, he is able to accomplish several things not secured by the ordinary dynamo.

One of the most exquisitely beautiful, as well as essential, features of the oscillator is yet to be mentioned. It is desirable that the frequency of the alternations in a current—its "period," as the experts call it—shall remain constant in the face of all variations of "load," or work demanded of it. This can be regulated with a spring of the proper stiffness attached to the oscillating rod. An "air spring," consisting of a piston inside an air-tight cylinder, may be made to perform this office, and the supplementary cylinder may be situated either close to the working cylinder or at some distance away, both pistons, however, being secured to the same rod. Again, proper air chambers at the end of the working cylinder may be made to serve as springs. By proportioning the size of the chamber of the air spring to the weight of the moving parts, the desired period is produced. Greater or less pressure of steam and any fluctuation in load may affect the length of the stroke, but not the frequency. There is still another mode of regulating the vibrations. It has been shown that electrical currents exhibit certain phenomena resembling those of sound. A circuit of a given "capacity" and "potential" is more favorable to vibrations of one frequency than any other. An instrument known as the "condenser" can be introduced in to an electrical circuit to "tune" the latter to the desired frequency of oscillation—thirty, fifty, eighty or any other number per second. Mr. Tesla has applied this principle of "resonance" to some of his experimental oscillators, and thus imparted to his apparatus a selective affinity for whatever rate of vibration he wants. This is an automatic governor which corrects any tendency to fall below or exceed the required speed. With such precision will this period be maintained that a clock may be driven with an oscillator and keep good time.

Reducing Electric Voltages.

There are several reasons why it may be desirable at times to change the voltage of an electric current. Perhaps for convenience in transmission, a higher voltage is used than is required by the consumer, and hence reduction is necessary at the end of the line. Again, several users, having a common source of supply, may require different voltages. The so-called "transformer," used only with an alternating current, consists of a motionless piece of apparatus—two coils of insulated copper wire, one inside of the other. The primary current flows in one, and the secondary, or induced, current in the other; and the proportion between the voltages of the two is regulated by that between the number of turns of wire in the respective coils. But this mechanism will not do for a continuous current. Instead, it is customary to use a combination of motor and dynamo, called the motor-dynamo. This calls for two sets of windings with wire on the armature or rotating part, the primary current flowing in the one and the secondary in the other. There, again, the respective voltages are proportioned to the number of turns of wire in the coils. Two commutators are necessary, too, on the axle, one leading the primary current in and out, and the other serving the secondary current similarly. In both the induction coil and the motor-dynamo, such conversion as has just been described alters the amperage (volume) at the same time as the voltage (pressure), but in the opposite direction.

It is announced that a new device for transforming a continuous current has been invented by J. J. Hogan, who is connected with the mechanical department of the psychological laboratory of Yale University. It is said to be much more simple and inexpensive than the motor-dynamo, but equally effectual. Within a few days tests of the apparatus have been made in the presence of expert electricians, representing various telegraph and telephone companies; and these men are quoted as admitting that the invention is a bona fide affair, and not a "fake" nor the product of a crank's fancy. It is claimed also that Mr. Hogan's method wastes less current than the one which it is designed to replace. Still further, it is adapted to the reduction of any voltage, no matter what, to any other voltage. This is an important advantage, since the motor-dynamo has to be wound with special reference to the work it does, and then will reduce only from a given figure to another predetermined figure. Mr. Hogan's apparatus is universal in application, and is regulated by the simple turn of a thumb-screw. For the present, however, he prefers not to have a detailed description published. Finally, it is claimed that this converter does not raise the amperage when reducing the voltage, but leaves the former unchanged.

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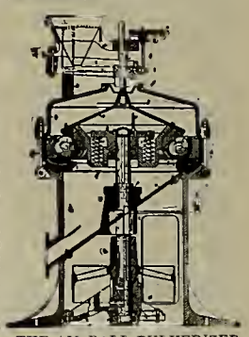

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A Machinist's Arm Filled With Wire.

The latest surprise in surgical operation, says a New York dispatch, is the removal of eleven feet two inches of one-sixteenth-inch wire from a man's body. This operation was performed at Bellevue by Dr. Rathbun, assisted by the house staff. The case is one of the most peculiar on record.

John Scanlan, a machinist, thirty years old, had worked several years for the East River Lead Works. Among other things manufactured there is lead wire, used largely for wrapping purposes, and by electricians. The lead wire is made by forcing a mass of metal through a die under a hydraulic pressure of 600 tons. The metal is hot, but cools as it is forced through the die in the shape of a wire. Scanlan was at his post. The machinery suddenly stopped. The man leaned forward and grasped the wire already through when there was a loud report; the die, or a portion of it, was blown out, and Scanlan was knocked to the floor. When he recovered from his dazed condition he felt no pain except in his left arm. He went to Bellevue hospital a few hours later, where the surgeon found a small abrasion of the skin near the wrist and all the indications of a fracture of the elbow. It was determined to remove the portions of shattered bones supposed to be there and Dr. Rathbun began the work. The point of the surgeon's knife had scarcely gone below the cuticle when he stopped, looking very much astonished. Then he pulled out a piece of lead wire and kept on pulling until out of the three-inch opening in the flesh over eleven feet of wire were drawn. Yet there had not been the slightest break in the skin or wound of any kind, except the little abrasion already alluded to. The doctors think that Scanlan took hold of the wire, and the explosion following, the wire, driven with great rapidity, caught on his wrist and was shot into his arm, as by an immense hypodermic syringe. Being soft and malleable it struck the humerus probably and doubled up and down the forearm and was imbedded in the muscles.

The Passing of the Horse.

A prominent electrical company has collected some startling figures, which show the almost incalculable influence of the introduction of the electric car, taken merely on its one basis of replacing the horse for traction purposes. It is estimated that electric cars have already displaced 1,100,000 horses, and this estimate is manifestly far below the actual number. The feeding of these horses would entail the consumption of 500,000 bushels of corn or oats a day. The animals are now back on grass, and the enormous decrease in corn and oats consumption caused by their withdrawal is sufficient to appreciably affect the prices of those grains. In round figures, it amounts to 180,000,000 bushels a year. There is another view of this subject, the significance of which will be probably more appareut a few years hence than it is even now. The loss of commercial demand for these coarse grains in the cities means an enormous decrease in the tonnage of the railroad freight traffic. This failure is already put at a minimum of 250,000 carloads. But it is not only in public traffic that the day of the horse is waning. In some cities the electric car lines have been so judiciously distributed and give such excellent service that many private families have given up their carriages and use the electric cars instead. In many places the business of the liverymen is practically ruined by the electric car, and, as at Niagara Falls, the formerly arrogant and extortionate hackman has become a comparatively civil and temporizing individual. The electric car and the bicycle have sounded the knell of the horse as a commercial factor.

THE longest dry-dock in the world is now building at Glasgow, Scotland. It will be 900 feet over all, 800 feet from inside face of caisson, 74 feet in width at bottom and 115 feet at top, and 28 feet deep from average high-water springs to floor. The entrance is to be 83 feet wide, with perpendicular sides, and to have a depth of 26 feet from average high-water springs to sill.

The Manufacture Of Wild Men.

There are many curious trades in the world, but the most strange must surely be the "artificial manufacture of wild men." Yet a well-known English doctor in China has just certified from his own personal experience that this art is regularly practiced in the Flowery Kingdom.

First a youth is kidnapped, then bit by bit he is flayed alive, and the skin of a dog or bear grafted piece by piece upon him. His vocal chords are next destroyed by the action of charcoal to make him dumb, and the double purpose of causing "etiolation" of the skin and utter degredation of the mental faculties is effected by keeping him immured in a perfectly dark hole for a number of years. In fact, by treating him like brute for a sufficiently long time he is made into one.

At last he is exhibited to the entirely credulous Chinese as a wild man of the woods, and his possessors reap a rich harvest.

The priests, it seems, are adepts at the art. When a kidnapper, however, is caught by the people he is torn to pieces, and when the authorities get him they torture him and promptly behead him. Such is life under the rule of the Son of Heaven.

A PHILADELPHIA COMPANY is making paving blocks of compressed hay.

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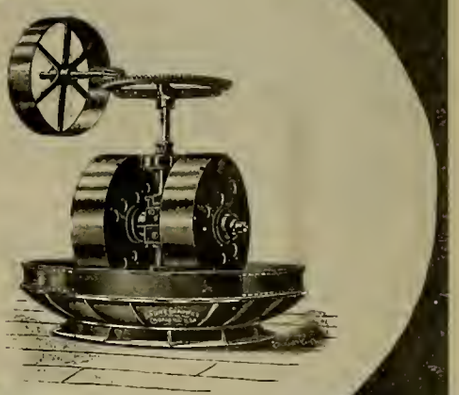

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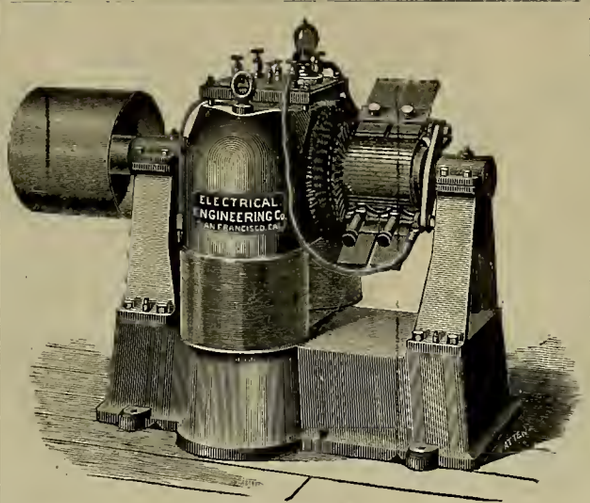

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ESTABLISHED 1863

Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us enables us to give advice which will save inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 220 Market St., S.F.

Market Reports.

The Markets.

SAN FRANCISCO, April 25, 1895.

Silver holds its own, aud a little more. That speculation more than permaneut advance characterized recent operations is evidenced by its unsteadiness. It is stated that China is to have six years in which to pay six installments of the war indemnity of 266,000,000 ounces silver, which would make that an additional annual purchase of 80% of the total product of this country.

A recent meeting of the Southern and Western rolling mill men, at which 87% of the total output was represented, it was agreed to steadily advance prices to an average of at least 10%. Mills are rejecting prices that ruled a week ago. Pig iron has advanced 25 cents a ton.

In their monthly report on ores and metals, James Lewis & Son, of Liverpool, England, under date of the 1st, write: Copper—After falling 8s 9d per ton on the 5th ult., from £39 2s 6d to £38 13s 9d, good merchantable copper closes 8s 9d higher for the past month, with buyers of cash at £39 11s 3d per ton. English and French public stocks are reduced 1755 tons, and the visible supply 1855 tons; the reduction in the private stocks here and on the continent must also he large. The advance of 3½d per ounce in silver has led to a good demand for manufactured copper for India, while Birmingham has taken considerable quantities of tough and best selected, and France has bought electrolytic copper. In American copper about 2000 tons of Lake and 1000 tons of electrolytic are reported as having been sold to the continent. After declining to 9.25 cents per lb, Lake is now quoted as 9.37½ cents, the demand for home consumption having improved. American shipments to Europe for the past month are only 3750 tons, making 14,423 tons for the first quarter of this year, against 20,444 tons for the same period last year. Imports are 1436 tons, and deliveries 2517 tons greater to date than during the same period last year. The arrivals in England from Chile during the month have been 1055, and the deliveries 819 tons fine, and from other countries 2758 and 3955 tons fine respectively. The arrivals in England from the United States have been 1064 tons bars and 140 tons matte, equal to about 1105 tons fine copper, and in France 506 tons fine. Quotations to-day are: Chile bars and good merchantable copper £39 11s 8d for casb, and £39 18s 9d for three months' prompt, buyers. English best selected ingots £43 to £43 10s, and tough cake £42 10s to £43 per ton. 7s 6d to 7s 9d for ore of 20%, and 7s 9d to 8s per unit for Chile regulus or American matte, free from silver.

It is reported in Euglaud that the recent scare as to the scarcity of platinum was got up for a purpose, and that the increase in price was due to a combination between some English users of the ore and a broker in St. Petersburg, who together controlled the production and got up a "corner" in this article. The increase in price has, however, provoked competition, and several new mines have been opened, which have increased the production considerahly. There are now at least forty mines at work in the Ural mountains, hut the plant employed is of a very primitive cbaracter. Some of the mine owners have now introduced steam power, hut at present the sand is not purified at the works, hut is being sent to an establishment in Germany, where it is prepared for the market. The yield of crude platinum for the year 1891 from the Ural provinces exceeds 9000 pounds, or fifty per cent more than the returns for the previous year.

New York Metal Market.

NEW YORK, April 25.—PIG IRON—Scotcb, 19@20c; American, 9.50@12.00c.
COPPER—Brokers', 9.75c; excbange, 9.55c.
LEAD—Brokers', $2.95; exchange, $3.07½.
TIN—Straits, 13.80@13.90c.
SPELTER—Domestic, $3.20.

New York Silver Prices.

NEW YORK, April 25.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30⅜	66½	9 55	.....
Saturday	30¼	66¼	9 57½	3 07½
Monday	30½	66⅞	.....	.....
Tuesday	30¼	66⅞	.....	.....
Wednesday	30¼	66⅝	9 55	3 07½
Thursday	30¼	67	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, ⅝ per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	7½c
New York Telegraphic Transfer	10c
London Bankers' 60 days	$4.88¾
London Merchants	$4.86
London Sight Bankers	$4.90
Refined Silver, per ounce	67c
Mexican Dollars, nominal	55@55½

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lh	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, johhing	—	@	16
Ingot, wholesale	13	@	14
TIN PLATE.			
Per hx	5 25	@	6 00
PIG TIN.			
Per lb	15	@	16 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Belcher S M Co, Nev	50	25c	Mar 5, Apr 9, Apr 30	C L Perkins, 309 Montgomery
Brunswick Con G M Co, Cal	8	2c	Mar 20, Apr 20, May 15	J Stadtfeld Jr, 309 Montgomery
Crown Point G & S M Co, Nev	65	25c	Mar 12, Apr 16, May 7	Jas. Newlands, Mills Building
H P Taylor M Co, Cal	—	4c	Apr 19, May 31, Jul 26	J Henry Smith, 431 California
Iowa M Co, Nev	20	5c	Mar 6, Apr 9, Apr 27	R L Thomas, 419 California
La Candelaria M Co, Mex	8	$3	Mar 7, Apr 9, Apr 27	G A Hill, 22 Market
Occidental Con M Co, Nev	18	10c	Mar 20, Apr 23, May 15	A K Durbrow, 309 Montgomsry
Ophir S M Co, Nevada	65	25c	April 4, May 7, May 27	E B Holmes, 50 Nevada Block
Overman, Nev	73	10c	Apr 15, May 21, Jun 11	Geo D Edwards, 414 California
Savage M Co, Nevada	86	20c	Apr 19, May 22, Jun 11	E B Holmes, 309 Montgomery
Yellow Jacket, Nev	59	25c	Apr 15, May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETING (SPECIAL).

Company and Location.	Secretary and Office in S. F.	Date.
Julia Consolidated	J Stadtfeld Jr, 309 Montgomery	May 3

LEAD.			
Pig	—	@	3 90
Bar	—	@	4 20
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "			1 45
Buck, Balls and Chilled, do, "			1 45
QUICKSILVER.			
Home trads, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 75
Nanaimo			6 50
Gilman			6 00
Seattle			6 25
Coos Bay			6 00
Cannel			10 50
Egg, hard			13 00
Wallssnd			7 50
Scotch Splint			7 75
Brymho			7 75
West Hartley			8 75
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	11 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Compaules'		75c	₱ hbl
English, to load	9 00	@	10 00
" spot, in hulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00
NAILS.			
Wire			$2 90
Cut			3 65
ZINC.			
Sheet	8¼	@	

Mining Share Market.

SAN FRANCISCO, April 25, 1895.

A low range of values and quiet business characterized the week. The condition of the Comstock has improved and faithful work is being done, hut that never had much to do with the stock market and of late years seems to have even less. So long as it is not a question of control of certain mines, the present flatness may continue, or until some few with nerve and amhition step in to liven things up. Con. Cal. & Virginia, Ophir and Hale & Norcross were held up, and on Thursday Virginia City bought freely, the demand being as freely met by Pine street.

The following illustrates the changes of the week:

Mines.	18	25
Alpha	$ 09	.....
Alta Consolidated	.....	$ 17
Andes	.....	.....
Belcher	73	65
Best & Belcher	88	78
Bodie	1 35	1 20
Bullion	.....	.....
Challenge	47	.....
Chollar	51	45
Confidence	.....	1 50
Consolidated California and Virginia	3 00	3 00
Consolidated New York	.....	.....
Crown Point	.....	62
Exchequer	.....	.....
Gould & Curry	51	45
Hale & Norcross	1 30	1 30
Justice	.....	10
Mexican	88	81
Ophir	1 70	1 65
Overman	13	09
Potosi	52	46
Savage	36	30
Sierra Nevada	86	81
Union	56	51
Utah	.....	.....
Yellow Jacket	49	37

San Francisco Stock Board Sales.

SAN FRANCISCO, April 25, 1895.

9:30 A. M. SESSION.

250	Alta	16	100	Gould & Curry	45
50		17	100	H & N	1 30
100	Belcher	65	300	Justice	10
150	Best & Belcher	78	100	Mexican	81
300	Bodie	1 20	100		80
100		1 15	300	Occidental	22
700	Chollar	45	200	Overman	09
950	Con Cal & Va	3 00	150	Potosi	46
100	Confidence	1 45	100	Savage	30
500	Crown Point	62	200	Sierra Nevada	81
300	E. B. & B.	12	100	Union	51

SECOND SESSION—2:30 P. M.

500	Alta	15	100	Hale & Norcross	1 25
200	Bodie	1 10	100	Ophir	1 60
600	Chollar	43	100		1 65
200	C. C. V	3 00	600	Occidental	25
200	Confidence	1 50	300	Silver Hill	04
200	Crown Point	60	100	Sierra Nevada	80
100	E. B & B	12	100	Yellow Jacket	37

HIRAM S. MAXIM, the inventor, says that New Englanders are the best mechanics in the world, and that the French are the best mechanics in Europe.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING APRIL 16, 1895.

537,559.—WAVE MOTOR—W. N. Best, Redoudo, Cal.

537,448.—SAVINGS BANK—J. H. Greefkens, S. F.

537,449.—SAVINGS BANK—J. H. Greefkens, S. F.

537,532.—TRUNK—W. C. T. Hausen, Seattle Wash.

537,451.—CONDENSER—W. P. Hawley, Oregou City, Or.

537,704.—ROASTER—N. H. McAuslan, Sutter City, Cal.

537,556.—GOLD-SAVING APPARATUS—A. G. Tingman, Indio, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreigu Pateut Agency, the following are worthy of special mention:

RIVETING MACHINE—John I. Smith, Chico, Butte Co., Cal. No. 534,527. Dated Feb. 19, 1895. The object of this invention is to provide a machine by which rivets and washers are delivered to a point where they are to be used to secure the parts of a helt or other object together. It consists of a table upon which the parts to he riveted are supported, and mechanism for seating the washers upon the parts, mechanism for perforating the hole through the parts from helow and for setting the rivets through the hole aud washer, and a mechanism for heading the rivets after heing set. The washers are contained in a vertically moving bollow receiver and are delivered singly upon the material, where they are held by a trestle foot until the hole is punched through the material hy a punch moving upwardly from helow through an opening in the tahle. A riveting punch is movable within the hollow presser foot so that the point rests upon the upwardly projecting end of the rivet and a hammer suspending above the head of the punch is released to fall upon it at the proper time, so as to upset the rivet and head it upon the washer. The rivets are contained in suitable holders, and a feeding tuhe is provided with a transversely moving slide aud actuating mechanism whereby a rivet is removed from the tube and transferred to the head of a plunger which receives it. After the hole has been punched in the material and the punch heen withdrawn, the plunger is elevated to force the rivet through the hole. Mechanism for operating the parts and producing the various motions consists essentially of reciprocating levers and pedals hy which they are connected and hy whieh they are operated.

RIVETING MACHINE.—Johu I. Smith, Chico, Butte Co., Cal. No. 537,314. Dated April 9, 1895. This invention relates to an apparatus for riveting articles together and automatically supplying rivets and washers, together with punches, one of which is advanced to punch a hole through the material, after which a rivet is forced through the hole and through a washer which has already been placed upon the opposite side of the material, after which a hammer is allowed to fall upon the head of a riveting punch, the lower end of which rests upon the point of the rivet where it projects through the washer. The actuating mechanism consists of a series of levers hy which the various parts are moved at the proper intervals, and these levers are so arranged with relation to a revolving wheel or disk having projecting teeth and spurs thereon that each of the actuatiug levers will he moved in its proper time so that the different movements necessary to complete the riveting will he effected at the proper intervals.

GOLD-SAVING APPARATUS.—B. M. Whitiug, Spokane, Washington. No. 537,257. Dated April 9, 1895. This invention relates to an apparatus which is especially designed to save fine gold found in placer mining, in connection with pulp or tailings and other waste matter. It consists of an inclined tuhe into which the material is fed, having its lower end open for the discharge of the worthless material, a cone-shaped drum fixed concentrically and exterior to it, with its lower surface horizontal and adapted to contain a body of mercury, a tuhe extending through the cone and projecting beyond the lower end, having the projecting end open for the discharge of the coarser material and perforations through which the finer material passes into the cone; means for feeding the material to be acted upon to the interior of the tuhe, whicb is suitably mounted so that it can he rotated for the purpose of gradually advancing the material from one end to the other down the incline, and allowing the finer material to pass through the perforations into the cone. Below the cone is a series of riffles consisting of a bottom having pockets and removable copper plates, over which the finer material and mercury passes after leaving the drum.

RAILWAY STREET AND STATION INDICATOR.—A. B. Murray of San Rafael, and Henry G. Krasky of San Francisco, Cal. No. 537,800. Dated April 9, 1895. This inventiou relates to a device which is adapted to indicate streets or stations and which is fixed within the car so as to he visihle to the occupants thereof. It consists of an indicating mechanism, a spiral disk having protuberances upon the periphery corresponding with the location of the streets or stations, and mechanism actuated hy said protuherances wherehy the indicator is advanced to show the name of the street or station, mechanism connected with the car axle whereby the spiral disk is rotated and advanced upon a stationary shaft, a gear mechanism intermediate between the car axle and the spiral disk, a lug upon the terminal plate of the disk, a lever mechanism which is engaged hy the lug when the disk has reached the end of its travel aud a stop actuated by the mechanism to engage and arrest the driving shaft so as to throw the actuating gears out of engagement and thus allow the car axle and its attachments to continue to revolve without affecting the registering mechanism.

Assessment Notices.

OVERMAN SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of April, 1895, an assessment, No. 73, of ten cents (10c.) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of May, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 11th day of June, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. D. EDWARDS, Secretary.
Office—No. 414 California street, San Francisco, California.

H. P. TAYLOR MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Liberty Mining District, Siskiyou county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the nineteenth day of April, 1895, an assessment of Four (4c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, 39 Merchants' Exchange, 431 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the thirty-first day of May, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on FRIDAY, the twenty-sixth day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HENRY SMITH, Secretary.
Office: 39 Merchants' Exchange, 431 California St., San Francisco.

A SPECIAL MEETING of the stockholders of the Julia Consolidated Mining Company will be held at the office of the company, room 56, No. 309 Montgomery street, San Francisco, California, on FRIDAY, the 3d day of May, 1895, at the hour of 1 o'clock, for the purpose of considering what disposition shall be made of stock now in the treasury of and belonging to this company, and the transaction of such other business as may come before the meeting. Transfer books will close on Tuesday, April 30th, at 3 o'clock P. M.

J. STADTFELD JR., Secretary.

ALBERT MALTMAN, Practical Metallurgist and Engineer.
SAMUEL C. THOMPSON, A. B. Yale University. E. M. Columbia University.

Maltman & Thompson,

MINING ENGINEERS AND METALLURGISTS,

Owners of Nevada County Reduction Works,

Address: Grass Valley, Nevada County, California.

Inspect and report upon Mineral Properties, Treat Refractory Gold Ores and Concentrates by Chlorination. Furnish Plans for and Superintend Erection of Chlorination Plants. General Analyses of Ores.

References:

Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
Edward M. Preston, President Citizens' Bank of Nevada City, California.

FOR SALE.

One 20-Stamp Wet Crushing Silver Mill,

Boss Process of Pan Amalgamation, 850-pouud Stamps, complete with power, 90 miles from Tucson, Arizona Ty. Address

E. W. BOWERS,
Tucson, A. T.

The Russell Process.

For information concerning this process for the reduction of ores containing precious metals, and terms of license, apply to

THE RUSSELL PROCESS CO.,
Park City, Utah.

Coast Industrial Notes.

The Los Angeles *Record* has imported 10,000 one-cent pieces.

—The Risdon Iron Works sent two Bryan mills to Mexico this week.

California printing ink is a new local industry and ought to be a profitable one.

The Standard Oil Co., which now almost completely controls the coast market, is still advancing prices.

—The Perkins Pump and Engine Co. have the contract for putting in an engine and pump for the Kern Co. asylum.

—C. H. Evans & Co. are building a pumping plant, with a capacity of 15,000 gallons per hour, for Cypress Lawn cemetery.

The Mechanics' Institute trustees are energetically arranging for the exposition of '95, which will be opened August 13th.

—The Directors of the San Joaquin Valley Road have decided to build a steel drawbridge across Mormon channel in Stockton.

The Oregon Central & Eastern Ry. Company has been incorporated at Corvallis, Or., to buy the Oregon Pacific property and operate it

The Watsonville beet sugar factory gives employment to 300 people. Twenty tons of beets are raised on an acre of land, for which the farmers receive $80.

—The advance in the price of beef will cause 4000 cars of cattle to be shipped East from the southwestern New Mexican ranges during the next six weeks.

—The Great Northern has joined the Northern Pacific in a decision not to use the reduced steamship rates from Puget Sound for passing to San Francisco.

—During the first fifteen days of April fourteen colliers arrived in San Francisco from the northern mines. The total of cargoes was 37,000 tons, valued at $296,000.

—An evidence of the good financial standing of the city of Los Angeles was furnished last Wednesday, when $396,000 in bonds were sold to Street, Wyke & Co., of New York, at 4½%.

—The net increase in the earnings of the Great Northern system in 1894, compared with the same six months of 1893, was $313,205.75 and the increase in the tax was $10,481.95.

—There are 347 vessels on the Pacific coast in the lumber trade, including steam and sailing vessels, which range in tonnage from the schooner Mary Etta, 85 tons, to the ship Oriental, 1400 tons.

—The Los Angeles and Santa Monica Electric Railway Company will build a railway between those places. There will be a branch fifteen miles long to Pasadena, another five miles long to Cold Water Canyon.

—The ship Olivebank has sailed from Vancouver, B. C., for South Africa with 2,323,684 feet of rough lumber. Her net tonnage is 2627 tons. She is the largest vessel ever loaded with lumber in British Columbia or on Puget Sound.

—General Manager D. B. Robinson of the Santa Fe denies the report that the Santa Fe will build 150 miles of line to make connection with the proposed railway from San Francisco southward and thus furnish an outlet for the Santa Fe on the coast. He says: "There is every indication, however, that a new road from San Francisco into southern California will be built." Mr. Robinson is of the opinion that the new Santa Fe Company will be in active operation by August 1st.

The Western Iron and Steel Company's rolling mill at Lakeview, Wash., started up this week. It is the only rolling mill on the coast outside of San Francisco, and has a daily capacity of eighty tons of bar iron. The start was made with seventy-five men.

—The Clarke and Cox land, known as the San Juan Grant, lying south of Orange Vale, north of the American river, and east of Rancho del Paso, has been bought by Chicago men for colonization purposes; the work of development is to be commenced at once.

—The Victor, Cal., Reservoir Company has sold its property to the Columbia Colonization Company of Chicago. It is proposed the reservoir will contain when full, to the 1465-foot level, 127,721,404,000 standard gallons of water, sufficient to irrigate 220,000 acres.

The Jones Creek Mill, Mining and Irrigating Company, to manufacture lumber for mining purposes, and for mining, has been incorporated at Crescent City, Cal., by John McLaughlin, Eugene Commerford, Wm. Frost, E. A. Frost and Peter Emetsburg. Capital stock, $80,000.

The *Railway Age* says Washington has nine railway companies who contemplate building 376 miles of road this year: Oregon four companies to build 213 miles, and Montana four companies to build 335 miles. To this may be added the S. F. and S. J. V. R. R., which proposes to build 340 miles in this State.

—The opposition in steamship traffic between here and the Sound is ended. The steamer Farallone has given up the rate war with the P. C. S. S. Co. and will run in future between San Francisco and Yaquina bay. Rates which have been $5 from here to Seattle will be advanced to $20 first class.

—The Ogden company organized to work the guano beds on one of the islands in Great Salt Lake, is making extensive preparations to engage in the business on a large scale. A pier will be constructed at Lake Park, a steamer built and shipments commenced as soon as possible. The company expects to sell 100,000 tons in Utah alone.

—A band of 5000 horses has been ordered slaughtered in eastern Washington and Oregon. The meat is to be canned and shipped to France. An effort will also be made to ship canned horseflesh to Japan. The horses were contracted for at the rate of $5 a head, and those not suitable for canning, it is said, will be treated at the rendering works.

—The recent shipment of a carload of California flowers to the Chicago market for the Easter trade was not an entire success, as a large portion of the carload arrived in a worthless condition. Out of 10,000 calla lilies, less than 4,000 of them were found fit for market. In the shipment there were several thousand date and fan palms and 10,000 marguerites in good condition.

—The Northern Pacific Railroad has begun improvements on the water front at Tacoma, Wash., that will cost $300,000. Local companies will make improvements costing $200,000 more. The railroad will build a solid rock and stone seawall along its water-front property. It will build four freight warehouses, each 40x400, and coal bunkers of 10,000 tons storage capacity, capable of handling 5000 tons per ten hours.

—The Oregon Railway & Navigation Co.'s committees of the collateral trust and consolidated mortgage bonds have agreed upon a plan of reorganization which provides that a general mortgage of $21,500,000 at 4% interest is to be issued, into which the present outstanding obligations are to be funded. The collateral trust bonds are to receive 50% in the new 4% bonds and 65% in new preferred stock. The consolidated bonds are to receive par in the new 4s, 21.9% in cash and 36¹.9% in preferred stock. The stock of the company is to be assessed $8 per share, for which preferred stock at par will be given. Of the new 4s $5,000,000 will be held in the treasury to retire the 6% bonds of 1903 when they mature.

—The London *Iron and Coal Trades Review* says: "The announcement that the order for the 20,000 tons of rails required for the new railway running from San Francisco southward has been captured by an American firm will occasion almost as much surprise on this side of the Atlantic as it has already done on the other. It was generally expected that the competition would be close, but as the freight charges favored the British manufacturer somewhat, it was considered most probable that the order would find its way to this country. The event, however, has proved otherwise."

—The H. C. Shaw Plow Works, at Stockton, have made a new twelve-gang plow, which is probably the largest of its kind ever constructed in this country. It was made especially for George McCouley, of Forest Lake, and is designed to turn over the ground for a width of ten feet. The beam on which the plows are fixed is 22 feet long, and the machine is 28 feet over all, from end to end. It will be drawn by a traction engine of 40-horse power. The levers operating on the plow are respectively 24 and 36 feet long. It is expected that a great many more of these plows will be ordered when the work of this one has been demonstrated. It is the first one of the kind ever made, and is a revelation to Eastern men. Last Saturday A. B. Farquhar, a large manufacturer of agricultural implements, of York, Pennsylvania, inspected the mammoth plow. "Nobody but a Californian," said he, "would construct a plow on such a scale. It is truly wonderful what you people out here can do."

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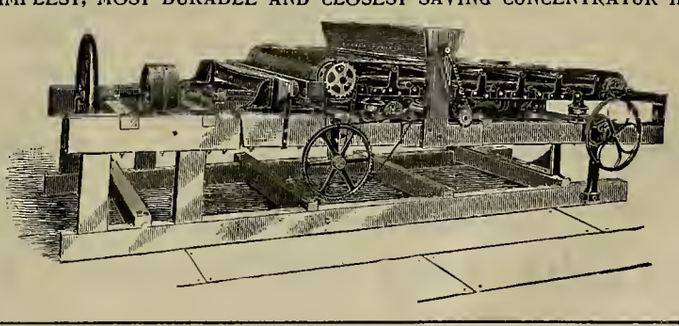

FALLS MINE, Igo, Shasta Co., Cal., May 25th, 1895.
THE McGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.
Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I have believed possible for any concentrator to accomplish.
Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 93¾ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.
You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
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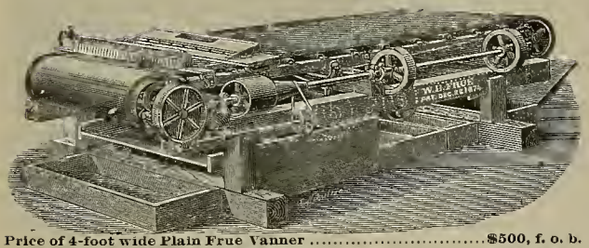

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GLADSTONE MINING COMPANY, FRENCH GULCH, Shasta Co., Cal.
C. J. Clark, M. E., Gen'l, Supt. Dec. 12, 1891.

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C. J. CLARK, Gen'l Supt.

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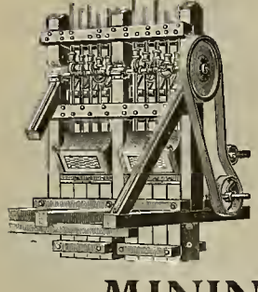

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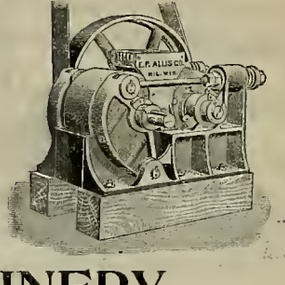

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AND PACIFIC ELECTRICAL REVIEW.

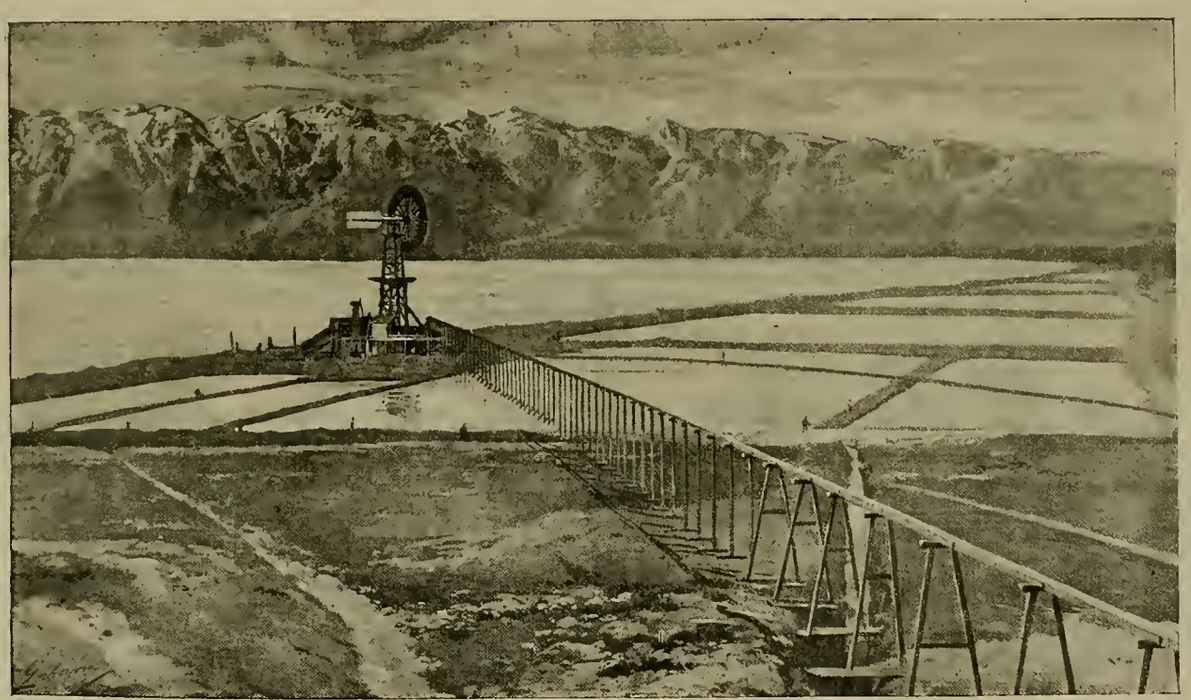
VOLUME LXX. Number 18. SAN FRANCISCO, SATURDAY, MAY 4, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Owens Lake: Carbonate of Soda Manufacture.

California's mineral wealth comprises almost everything that can be classed as mineral, much of which is as yet undeveloped. In Inyo county the Inyo Development Co. many years ago established works for the manufacture of carbonate of soda from the waters of Owens lake, which industry is in operation through the summer months. The accompanying cut gives a very good idea of the lake and the evaporating basins. The works are one mile north of Keeler and are owned in Carson, Nevada.

The lake itself is as unattractive in character as its somber surroundings. In its waters are great quantities of green, slimy vegetable organisms of some low order, one of which forms small globules or spheres about one-fourth of an inch in diameter. There are also several different species of flies which swarm around the lake, and one small species, in particular, which in many places literally blackens the shores with its myriads. There are also in the waters of this lake myriads of small larva, from one-eighth to one-fourth of an inch in length, with many legs and two very black eyes, which somewhat resembles the larva or "wiggler" of the ordinary mosquito, and which are believed to be the larva of the small and multitudinous fly. Each one of these larvæ is inclosed in an almost transparent sack of thin, gelatinous matter. How he makes his way through the water inside of this sack is not known; but he does it, and goes where he pleases. As to the white worms which also exist by millions in this lake, and which by some sort of sticky excretion form sandy cases or coatings for themselves, and which, when washed ashore in masses by the surf, the Indians used to gather, and after drying them and rubbing off their coats, use them for food, it is not known whether they are an intermediate state of the insect between the above-mentioned larva and the fly, or what they are. The fact remains that they exist. Strange as it may seem that a lake, whose waters have the composition which those of Owens lake have, should support life of any kind, it is nevertheless, not only that those waters are full of life, but also that the decay of such life, when washed up on the shores by the surf, and thus left exposed to the sun, often taints the air by its stench for miles around. No ordinary fish can live in Owens lake. There are fish in Owens river, but whenever these find their way down into the lake they quickly die, and are washed ashore.

North of Keeler, on the shore of the lake, are the chief works of the Inyo Development Company, manufacturing carbonate of soda from the waters of the lake. When last visited, for purposes of illustrative description, they had about fifteen acres of ground covered with evaporating vats, made by plowing and then carefully leveling, and afterwards heavily rolling the clayey ground, so as to make it water tight. The water of the lake in July registered 9° Baume, corresponding to a specific gravity of about 1.063. Three months earlier it was 7½° Baume, corresponding to a specific gravity of 1.052. The salts which it contains are chiefly chloride of sodium (common salt) and the monocarbonate, bicarbonate and sulphate of soda.



OWENS LAKE, INYO COUNTY, SHOWING SODA EVAPORATING BASINS.

There is at a low temperature but little difference in the solubility of these salts; at a higher temperature the monocarbonate and the bicarbonate will crystallize out together in the shape of a definite chemical combination with its own form of crystallization, while nearly all the chloride and sulphate yet remain in solution; therefore, their "cold weather soda" is a compound of all the salts, while their "hot weather soda" is a nearly pure combination of the two carbonates with very little of either the sulphate or the chloride.

The crystallization takes place, at a proper temperature, at from 30° to 35° Baume, corresponding to a specific gravity of from 1.245 to 1.299. The substance thus crystallized out at this stage is a definite chemical compound of the two carbonates of soda, which has its own peculiar form of crystallization. This peculiar combination of the two carbonates of soda will only crystallize in this way, in the presence of the chloride and the sulphate, inasmuch as, if it be dissolved in pure water, it cannot then be made to recrystallize in the same form, but will be decomposed, and the monocarbonate and the bicarbonate will then crystallize separately in different forms. On this principle works were erected for the re-solution, recrystallization, and thus the separation of the two carbonates. The water of the lake is lifted twelve feet to the highest vats by a windmill. The mother liquor, containing chiefly the chloride and the sulphate of soda, is returned to the lake.

New discoveries of asbestos or fibrous serpentine in Placer county are of economic importance, indicating the extended possession of this mineral wealth in a wider area in this State than was supposed. California produces the only asbestos in the United States of marketable value, and even that is of meager quantity—never over seventy-five tons annually, worth say $60 per ton. It is not considered of as fine quality as the Italian asbestos, but nearly equal in that regard to the Quebec article, which province furnishes the most of the American market supply. Asbestos mines have been reported in Montana, Wyoming and elsewhere, but the product is, thus far, not a commercial quantity. Its uses are various: fire-proof paint; felt covering for steam pipes and furnaces; packing for pistons and valve stems; curtain cloth, are among the many uses to which this "mineral wool" is applied.

The control of the Sutro tunnel has passed by purchase into the hands of a syndicate composed of European and New York men, who, it is thought, will reorganize matters in such a way as to acquire and work some of the properties it touches. The history of the tunnel from its incipiency to the present time would form one of the most interesting chapters in the annals of Nevada mines. An opportunity, even at this late date, exists to make the enterprise pay well in the light of improved mining processes.

An English chemist named Armstrong asserts it as his belief that no chemical action ever takes place except in the presence of some substance capable of being decomposed by electricity, and that therefore all chemical phenomena are electrical.

The Mexican Exposition will begin April 2, 1896.

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J. F. HALLORAN.....General Manager

San Francisco, May 4, 1895.

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THE National Associatiou of Mauufacturers will hold its secoud annual meetiug in Chicago on the 15th of next October, at which time the Manufacturers and Producers' Association of California will be adequately represented.

THE Governor of California recently wrote to the Governor of Nevada, courteously inviting his co-operation in the matter of securing the meeting of national couventions in San Francisco in '96. He replied discourteously, and the press of the Silver State reproves him for his ungentlemanly action.

RECENT statistics indicate that the number of stamps in present operation in this State about equals the uumber in present operation in the Witwatersrandt district, South Africa—something over 3200 in each case. The daily average of the South African stamps is stated to be four tons, which appears to be an overstatement.

THE *Record-Union* reiterates in its tirades the statement that up to April 1st 112 hydraulic mines have been licensed to operate. The correct number is 86, but neither correctness nor accuracy form any part of the present onslaught. The statement quoted is 76 per cent truth, which is by far the highest percentage of correctness noted in the flood of its statements on this subject. It continues to say a great deal, and if it keeps on may get to believing its assertions itself after a while.

IN response to continued inquiries it is again stated that there has been no suspension of the federal law this year regarding the amount of annual required assessment work on unpatented claims. There was in '93 and '94, but this year the $100 work or improvement must be done. Nor is there the slightest likelihood that the Congress which meets on the 2nd of next December will do anything in the matter, if for no other reason than it would be then too late in the year to make effective any legislation applicable to so wide an area.

THE U. S. Court of Appeals, in this city, last Tuesday decided a case of some interest to miners. D. Hunter, et al., jumped E. L. Preston's placer claim in Flathead Co., Montana, and when suit for ejection was brought, they claimed that his declaratory notice and oath were not made and dated in accordance with the Montana law. A Montana court found for the jumpers. On appeal the court this week reverses the lower court's decision, holdiug that Preston's notice and location were all straight under the mining laws of the U. S. Preston's declaratory notice had a notarial ackuowledgement. The Montana law requires that it be sworn to. This the Court of Appeals holds to be unnecessary.

Freight Rates.

Denver demands railroad freight-rate concessions and in a suit now going on there, instituted by Geo. J. Kindel, the testimony of the freight agents of the Union Pacific, Santa Fe and Southern Pacific systems is of interest to members of the Manufacturers' and Producers' Association of this State. The Colorado shippers want to be put on the same oasis as Chicago in relation to business ou this coast. It is the old question of "long haul" and "short haul," additionally affected by the favorable situatiou of San Francisco with water-route competition, and its geographical and industrial advantage.

The main charge of the Colorado Fuel and Iron Co. is that while an open rate of 60 cents per 100 lbs. on steel rails is allowed from Chicago to San Francisco, the rate from Pueblo is $1.60. The Colorado Iron Works complains that Chicago is also favored on points east and south, and though 1000 miles farther than Denver from El Paso, Texas, yet has a rate within nine cents of that from Denver. The Pueblo company claimed that with fairer adjustment of rates they could have successfully competed for the contract for the 12,000 tons of rails for the San Joaquin Valley Road; but it is a matter of general information that the Pueblo people are in the combine with other rolling mills not to go below certain prices, and that price in Pueblo is $25 per ton, while the Valley Road has a contract for the rails at $26.40 per ton, delivered here.

Some candid statements were made. Mr. Smurr of the Southern Pacific told the Commission on Wednesday of last week that a 50-cent rate from Pueblo to San Francisco on steel rails and fastenings would pay the railroad company the same as a 60-cent rate to this city from Chicago, and that a 33-cent rate on iron pipe and castings carried here would pay as well as a 50-cent rate from Chicago. Chairman Morrison of the Commission said that making rates cheap to this coast would close all the mills in the country, except those on the Atlantic coast. Mr. Smurr said the steamers received 19 70-100ths per cent of the business between New York and San Francisco. In the division of freight between Chicago and San Francisco in the haul of steel rails the Illinois Central receives 24 3-10ths and the Southern Pacific the remainder, or about 33 cents per 100 pounds. Shipments of 2000 tons of rails were recently made on this rate. He said there arrived here from foreign ports around Cape Horn last year 2,740,000 packages of goods which practically came into competition with goods manufactured in the United States. Packages would weigh from 50 to 2000 pounds.

There have been coming to San Francisco from New York by water dry goods, bags and baggings, bats and wadding, furniture, glass, sewing machines, springs, steel, stores, tinplate, tinware, wire netting, hair rope and curled hair, hemp, jute, iron bar, pigs and scraps, lead, pipe, machinery, mats and matting, moss, railroad material, wire goods, cotton yarn, etc.

The railroad carries goods from New York to San Francisco in fourteen days: the Panama route requires about forty days.

Said Mr. Smurr: "Market competition fixes our rates to a large extent. San Francisco is a market for stoves. The stove that can be sold the cheapest and laid down the cheapest is the stove that will be sold in the San Fraucisco market.

"In the case of steel rails they are carried from Pittsburg in clippers at 15 cents per 100 pounds, and from there to San Francisco for 40 cents. To get the haul, the railroads must meet it with a rate of 55 cents."

Regarding the competition on steel rails, Mr. Smurr said: "The rate on rails is 60 cents from New York to San Francisco by rail; by sea about $5 a ton."

The attorney for the Colorado people asked Mr. Smurr if he thought a $1.60 rate from Denver fair as compared with a 60-cent rate from Chicago on the same goods. The reply was: "We say a $1.60 rate from Pueblo to San Francisco is a logical rate. We would like to see the competition of markets enter into the question of rates whenever it can be considered without involving the railroads into observance of the long and short haul between all points."

The whole question of Denver or Chicago or New York entering into competition with San Francisco is of importance only as commeusurate with their natural resources, industrial skill and commercial zeal. Prices and quality of products determine the market.

The discussion now going on in Deuver is of less local importance thau would be one here of Eastbound freights. The question of supremest interest has, so far as we know, not yet been touched on—Shall San Francisco manufacturers about face and move to have this city considered as one of the front doors instead of the back door of the American continent?

Needs Revision.

Mr. Edward Atkinson is our most prominent American statistician. His pleasant though inaccurate style of argument militates against the value of the statistics he so laboriously collates. In the most recent of the many brochures favoring gold monometallism, Mr. Atkinson says:

> In 1860 the unit or standard of value of this country was a dollar made of gold. It had been so since 1834, when, in order to keep silver coin for small change in the country, the standard of silver coinage was reduced from that which had been established by Hamilton at 16 of silver to 1 of gold to 15 to 1.

Mr. Atkinson knows a great many things that are not so. The above is one of them. The fact that the excerpt quoted is exactly opposite to the truth does not tend to augment Mr. A.'s reputation for accuracy.

In 1792 the ratio favored by Alexander Hamilton, after patient research, and fixed by law, was 15 to 1. This was changed in 1834 to 16 to 1, when the law made each eagle contain 232 grains of pure gold, instead of 247½ grains, as by the law of 1792. The gold dollar of 1792 had 24¾ grains of pure gold. In 1834 it was reduced to 23¼ grains of pure gold.

THE contest between the railroad companies and the miners of Montana, similar in the main to the present one of like character in this State, resulted in the last days of the 53d Congress in a victory for the miner, a law being passed authorizing the President to appoint three commissioners to classify the mineral area of that State; this being supplementary to the suspension of issuance of patents to the railway companies for unadjudged mineral lands therein. President Cleveland's appointees are non-residents of Montana. His motives are not to be impugned, but it is a matter of regret that he saw fit to ignore the fact that Montana has many mining men, manifestly more fit to properly discharge the duties of such commission than citizens of Ohio or Indiana. Were the question one of purely agricultural land in either of those States, an Ohio or Indiana man might express some surprise were the President to select a resident of a Montana mining town or a California mine superintendent to constitute the determining body. The matter is one of keen disappointment in Montana. The Governor of that commonwealth writes: "Men destitute of practical knowledge bearing upon the matter of mineral lands, whose ideas have been formed in a school of experience wholly different from the conditions which will surround them as members of a commission to classify these lands, cannot, in the nature of things, deal as intelligently with the question as the interests of the people require. It is the misfortune of those States directly interested in the preservation of their mineral lands that their classification should be delegated to men confessedly ignorant of the nature and scope of the duties they will be called upon to perform." He has selected three Montana men to co-operate (if allowed) with the presidential appointees, and delicately tender some necessary knowledge of the subject in dispute.

REGARDING overproduction, want of consumption, etc., it is remarked:

1. That production, in the grand aggregate, doubles every ten years.

2. That in each decade there is usually a period of about five years in which it declines, or remains practically stationary.

3. That in the succeeding five years it usually leaps forward, till the grand average of ten per cent annual increase is attained.

4. We are in the fifth year of decline from the maximum output of 1890.

Concentrates.

THE Truckee river is higher than for several years.

THE Pilot Bny. B. C., smelter is temporarily closed down.

THE Denver paper mills have daily used six tons of kaolin from Silver Cliff.

IT is believed that the gold output of California for '95 will aggregate $15,000,000.

A 40-STAMP MILL is now running steadily on the Congress mine, near Prescott, Arizona.

A 100-FOOT TUNNEL is being run in the Lupin gravel mine, Washington ridge, Nevada Co.

THERE are 300 more men at work in the coal mines in Belt, Idaho, than there were a year ago.

THE Black Oak mine, near New England Mills, Placer county, is reported bonded for $60,000.

THE United Verde Copper Company gives employment to 300 men at its mines at Jerome, Arizona.

IT is expected that work will shortly be resumed on the Centennial mine, Washington ridge, Nevada Co.

THE Nevada City *Herald* bears that Supt. Howard intends adding ten stamps to the Oak Tree mill at Maybert.

ALEX. BARING has bought the North Pole quartz mine, in Cracker Creek district, Baker Co., Oregon, for $55,000.

HAVILAH, Kern Co., is shipping a carload of antimony ore a month here, where it brings $35 per ton. The ore yields from 45 to 60%.

THE Granite Hill Mining Co., Nevada Co., have rejected the bids for pumping water out of the mine and hired men on day's pay to do it.

THERE are now seventy-eight men at work in the various mines near Silver City, Nevada, and a large number are working individual claims.

THE *Tribune* says Salt Lake smelters are endeavoring to obtain cheaper production methods in order to successfully compete with prevailing conditions.

THE Wadsworth, Nev., *Dispatch* says about every day finds some miner with blankets on his back passing through there en route to Butte City, Montana.

THE new 30-stamp mill at Silver Peak, Nevada, will start up about the 1st prox. There is already enough ore on the dump to keep the mill running several months.

PROSPECTORS are reported "rushing" from all parts of New Mexico and Arizona toward the newly alleged gold find at Carlisle, fifty miles from Lordsburg, New Mexico.

AMALIE mining district has been organized in Kern Co., Cal., at Amalie P. O.; Geo. E. Foster, district recorder. The Occidental Mining Co. is pushing development work.

ADA REHAN in silver, the celebrated statue from Montana, is now on exhibition here in a store on Market street. It is nine feet high, of solid silver, and is valued at $64,800.

THE *Inter-Mountain* says that the men working on the 1000-foot level of the Anaconda mine at Butte, Montana, find their whiskers "changing from their natural color to a pale green."

THE Henrietta quartz mill, near the Alta mines in Owyhee county, Idaho, has been leased to the Alta Gold Mining Co. for the period of one year, and will immediately be put in operation.

THE largest bar of gold bullion ever cast at the Boise, Idaho, assay office weighs 1334.34 ounces, is 937 fine, worth $25,888.15, the product of twenty-three days' run at the Virtue mine, Baker City, Oregon.

THE Lockwood Consolidated Mining and Milling Company has incorporated in this city. Capital stock, $1,000,000. L. Sborcs, T. Fox, R. Feige, K. J. Turner and C. Cleve of San Francisco, directors.

THE Bimetallic Mining Company has incorporated in Oakland. Capital stock, $2,000,000. J. L. Green, A. J. Cabral of San Francisco, J. H. Lucas, J. F. McShain and J. M. Strout of Oakland, directors.

A DEPOSIT of native quicksilver found in the center of the town of Calistoga revives memories of similar finds, which ended indefinitely. The present find occasions considerable prospecting in the vicinity.

THE Gold Bank, at Forbestown, Cal., now has its shaft down 350 feet. A tunnel is being driven to tap the ledge at the depth of 1400 feet. The ledge is eighteen feet in thickness and of a uniform rich character. Ninety men are employed.

THE Odessa Gold Mining Company has incorporated in Sacramento; capital stock, $1,000,000. G. A. Ottmann, H. W. Bragg, J. A. Peck, R. C. Irvine and G. C. Holbrook of that city are directors. They will operate a mine in Shasta county.

THE first gold ever known to have been taken from the middle fork of the Coquille river, Oregon, was brought into Marshfield this week and sold to B. C. Lehmanowsky. It was placer mined from the river bed opposite Enchanted prairie.

THE Denver *Record* says that an Eastern chemist passed through that city a few days ago on route from southern Colorado, where he has been examining a discovery of tin ore. He predicts "a tremendous excitement" as soon as the locality is made public.

THE Lake View Mining Company will start on their mines on the 15th. They are building a twenty-stamp mill. J. W. Moakler is manager. This group of mining claims is in the South Side mining district, thirteen miles from Argenta and twenty-eight miles from Dillon, Montana.

THE 12th report of the State Mineralogist is about out of print. There were 6000 copies printed, but the extraordinary demand has exhausted the supply. The universal interest in the gold mines of the State and the valuable nature of the report occasioned an unusual run on the volume.

IN the Cochiti district, Colorado, smelter returns show a general average of 25 to 35 per cent gold, the balance being silver. Specimen assay samples run high, but the average smelter returns so far, for assorted ores shipped, appears to be from $80 to $100 per ton; ores taken out of all of the principal prospects ranging from $20 to $40 per ton are not being shipped at present.

LAST Monday night the body of John Manahan, fifty-five years of age, who had been missing for two weeks, was found partially submerged in the bottom of the shaft of an abandoned mine on Domarest Hill, near Angels, Calaveras Co. A coroner's jury returned a verdict of accidental death.

E. S. DEGOLYER is developing the Gottschalk mine, near San Andreas; a 3-compartment shaft is down 100 feet, and a crosscut started west. The rock assays $10 to $15. A complete plant will be put in. The owner will return from Salt Lake this week to reside at San Andreas permanently.

THE annual company is being organized to look for a mythical gold ledge found on the Mojave desert many years ago, but lost sight of by reason of the death from heat and thirst of the finder. Considerable money and effort are yearly squandered in this way, but usually the expedition starts a little earlier than May.

D. BONELLI, of Rioville, Nevada, has bonded his mine claims to Salt Lake parties for $10,000, final payments to be made by the first of November next. Four men are at work opening the claims up. They are situated about fifteen miles up the river from Rioville. Sheets of mica six inches square are taken out.

T. PATTERSON, of White Hills, Arizona, has bonded from Phelps and Holmes their interests in the Crescent, Nevada, district for $8000 for three months and have men at work on some of the claims. Part of the money is already paid, and he is said to be negotiating for the purchase of the Legal Tender Co.'s mill.

GOLD RECEIPTS at the Denver branch mint during April reached $241,572.10, compared with $483,242.62 for April, 1894, a decrease of $241,670.52, or fifty per cent. The falling off is accounted for by the entire absence of deposits of gold bars by the smelters, which are being disposed of at a premium to brokers in New York.

THE Nevada *Transcript* says that it cost the shareholders of the Idaho mine $38,549.75 to realize about $12,000,000, which was the total production at the time of its purchase by the Maryland Company. That is an exception to the rule, but there are many other instances of magnificent returns on meager investments.

W. F. KENDRICK, of Denver, writes: "There is a large increase in the tonnage of ore received at the smelters since the dissolution of the Smelters' Clearing House Association, on account of the reduction of both smelting and railroad charges, which encourages the shipping of a lower grade of ores, which can now be sold at a liberal profit."

H. E. PICKETT, manager and part owner of the Grand Victory mine, near Placerville, says, regarding the present litigation, that neither Clark nor Stratton own anything in the mine; that Thompson had some contingent interest with Clark, but that was all extinguished before the present owners took hold of the property.

HIRAM JOHNSON is going to build a mill in Eureka, Nevada, to work the ores of the Silver Comet mine by the cyanide process. Should this prove to be a success the base metal range will be greatly benefited by it, as there are thousands of tons of low-grade ore around there which at the present time cannot be worked to any advantage.

A COMPANY has been incorporated to work a mine of mineral wax near Pleasant Valley Junction, Utah. The wax is contained in small veins and reservoirs in one larger vein. It resembles beeswax in nature, not burning but merely melting down. Genuine oil rock accompanies the wax. Extensive commercial use is expected to be made of the substance.

C. W. AND C. H. JACKSON, of New York City, and A. Case of Boise, Idaho, have bought the Phœnix mine, Robinsonville district, Baker Co., Oregon, for $40,000, one-half to be paid on the 5th prox., the remainder conditional upon the showing made by the mine in a certain time under vigorous development, the cost of which is to be borne by the purchasers.

AT the Taylor mine, four miles from Georgetown, El Dorado Co., the work of timbering keeps a force of men employed. They now have 3000 saw logs on hand, 18 to 40 inches diameter. The milling plant has 40 steel 1000-lb. stamps, which have a 4½-in. drop and a speed of 105 drops per minute. A 13,000-lb. Gates crusher, of 25 tons capacity an hour, is part of the equipment.

A DISPATCH from Aguas Calientes, Mex., says: "One hundred cars loaded with machinery for the new smelter that is being erected here by the Guggenheims, of New York and Philadelphia, have arrived. The smelter will be the largest in the world. The Guggenheims have already purchased $5,000,000 worth of copper ore, which is awaiting the completion of the smelter to be reduced."

PORTER & RICHARDS have an electro-chemical process in the neighborhood of Kernville, Cal., by which they claim to work ore to 90% of its assay value that formerly gave only 22%. At the Big Blue, where 80 stamps ran steadily for five years, the average yield was not over 30% of the assay value, the other 70 being supposed to be in the bed of Kern river. The new process should make that mine a valuable property.

UNDER the State law of March, '93, California mine owners are required to use a uniform code of bell signals in hoisting, and to properly post copies of the rules in their mines. If the rules are not observed or notices not posted the owners are liable for damages for any accidents that may occur in such mine while it is operated contrary to law. The official code, printed on cloth and ready for posting, can be had at this office.

TALKING of Montana the Butte *Review* says that this is going to be a great season for mining operations, more particularly in the line of prospecting and the opening up of new placer and quartz districts. Already the hills are filled with prospectors opening up ground that for many years has been considered worthless. Old mines that have been abandoned for years and placer diggings that were abandoned long ago are again being worked.

THE entire plant of the Double Eagle Mining Company, of Maiden, Montana, was sold at sheriff's sale Thursday to satisfy judgments of three preferred creditors, aggregating about $10,000. The famous Spotted Horse mine, which in its time has been one of the fancy gold producers of Montana, was chief among the properties to be knocked off to the highest bidder, and the celebrated mine, the pride of Fergus county, went for a song, mine and mill bringing $8000.

ACCORDING to the Cripple Creek, Colorado, *Journal*, the leasers of that camp are making mines out of the ground that would otherwise be lying idle did they not take hold and open them up. The companies simply hold the sack and rake in their royalties, ranging from 15% to 25%. Then come the hungry sub-leasers who are anxious to get a mouthful of ground that they may make a living for themselves—and money for the company. They pay from 20% to 35%, and some as high as 40%.

AT the McCabe mine, near Prescott, Arizona, last Saturday, Peter McGlendon, a miner, started with a companion to go from the 350-foot level to the top of the shaft in a cage used for hoisting ore. At the 350-foot level he took a third man on; and in pulling the bell cord to signal the engineer to hoist the cage, the wire rope broke about 200 feet above them and dropped on to the cage, catching McGlendon in its coils, causing him to fall sixty feet to the bottom of the shaft. His neck was broken by the fall. His two companions escaped without injury.

THE deepest gold reef in Australia is the property of the New Chum Railway Gold Mining Company, Bendigo, Victoria. The reef is being worked at the depth of 2,845 ft. from the surface, and a crushing of 197 tons of quartz has yielded 285 ozs. of gold. The temperature in the level is excessively high, the air heavy and oppressive through impurities exhausted from the air-driven rock-drills, and the water which oozes from the face is quite warm. The men at work wear nothing but trousers and boots, and the perspiration streams off their bodies as though they were being hosed down.

PROFESSOR R. H. BLIVEN, who committed suicide at Loomis, Wash., last week, was a thorough assayer, chemist and metallurgist, and had been identified with Okanogan since it became a mining country, being connected with the Black Bear mill and later with the Triune mill. He had for a long time been working upon a chemical process of extracting metals from ore, which was considered practical by many of those who had witnessed the operation. In small tests, twenty minutes was sufficient to liquefy the pulp and precipitate the metals. The knowledge of this process dies with him.

MESSRS. HOOPER, TIBBETTS AND ALLISON are building a ten-stamp quartz mill at the forks of Kern river to be run on Keysville ore. They have the ditch ready to turn water on the wheel and the excavation finished for the mill and the tail-race. This site is on the banks of Rich gulch, out of the reach of the freshets of Kern river. Early miners made many efforts to utilize the waters of Kern river in crushing Keysville rock, but all these efforts came to grief as the result of high water, and of late years most of the gold of that district has been taken out by horse power at an average cost of about $8 per ton in addition to hauling.

THE Mayflower, in Placer Co., paid a dividend of $10,000 in March, a total of $30,000 since Jan. 1st. The Morning Star, in the same county, paid $16,800 that month, $36,000 since Jan. 1st. The Standard, of Bodie, also paid $10,000 in March. The Kennedy mine, of Amador county, has paid $96,000 since Jan. 1st. Others not reported are paying big monthly dividends right along. It is calculated that 148 dividend-paying mines have paid $300,000,000 since '71. It is figured that their gross output for that time was $1,500,000,000 and that $1,200,000,000 was paid out for machinery, supplies, labor, etc. That is, a billion and a half was added to the solid, tangible, permanent wealth of the world, the dividend part being incidental.

AMONG recent Colorado gold mining incorporations are the Minnie Brown Mining Company, an Ohio concern; capital stock, $25,000; A. E. Monett of Sterling, Colo., is local agent; High Line Gold Placer Mining Company, to develop placer claims in Rio Hondo mining district, Taos county; capital, $1,000,000; Maxon Mining Company; capital stock, $10,000; to operate in Boulder county; Mineral Hill Gold Mining and Milling Company; capital stock, $500,000; to operate in Park and Arapahoe counties; Gough Mining Company; capital stock, $100,000; to operate in El Paso county; Midas Mining Company: capital stock, $100,000; to operate in Lake and Arapahoe counties; The Manthald Gold Mining Company; capital stock, $250,000; to operate in Gilpin county; The Erie Gold Mining and Milling Company: capital stock, $100,000; headquarters in Denver.

CONSIDERABLE placer mining will be done in southern Oregon this season. There is some stir in the vicinity of Gold Hill, about fifteen miles from Jacksonville, Jackson Co. The Gold Hill Channel Mining Co. has several claims on Foote creek, two miles from Rogue river, along an ancient river channel which they have tunneled 1500 feet and which turns out "black gold" bringing $18 an ounce at the mint in this city. Ed. Schieffelin, the discoverer of the Tombstone, Arizona, mines, is running a tunnel near Woodville, the ore from which is rich in free gold. He has another claim on California creek, and a five-stamp mill which turns out good returns. F. Laurence, from another adjacent quartz claim, recently sent 11 tons of ore to this city, which brought him $4800, at an alleged expense of $500. It's a good country to mine in, and is attracting the renewed attention of the prospector and the capitalist.

THE daily questions sent to this office often embrace some that make correct answer difficult. The inquiries are answered as quickly and correctly as possible, though accuracy is not always claimed. One came last Tuesday week that is given publicity, contrary to our usual custom. It is: "How many stamps are in preseut operation in California?" From procurable data it is believed that the following would approximate the number: Amador, 245; Butte, 175; Calaveras, 290; El Dorado, 330; Fresno, 40; Inyo, 25; Kern, 35; Lassen, 40; Los Angeles, 25; Madera, 35; Mariposa, 35; Mono, 90; Nevada, 375; Placer, 140; Plumas, 180; Riverside, 90; San Bernardino, 65; San Diego, 75; Shasta, 295; Sierra, 90; Siskiyou, 190; Tulare, 40; Tuolumne, 70; Trinity, 105; Ventura, 20; Yuba, 25. Total, 3125. Exactness is not claimed. If any recent list has been published it has escaped our attention, and any effort to secure the exact number must, obviously, be approximate. If our interior contemporaries, who are severally better acquainted with their localities than any one person can be, will send a completed estimate of the number in operation of which they are cognizant, the PRESS will be pleased to publish it.

A Great Mining Empire, and Other Matters.

To the Editor:—We of California have a great idea of our enterprise in mining. During the bonanza days we showed an aptitude for the pursuit, and during the excitement of the Comstock we had much to be proud of, but when we come to compare all we ever did there, even were we to class the entire Comstock as oue enterprise, and all we have done siuce, the whole falls into insignificance when we stop to review the scope of the British South African Co., which has secured from the English Government a miuing empire larger than all the mining counties of California combined, and in that territory they have discovered and "pegged off" 1890 miles of quartz reefs. This stupendous incorporation, with its $100,000,000 of capital, is capitalizing other companies and placing them on the European market, all formiug a source of revenue that will outvie in time the fabled wealth of Croesus. Out of these 1890 miles of quartz claims there are 380 miles of ancient workings, and it is estimated that millions of pounds of gold have been extracted, judging from the excavations made.

At the present time all Europe is in a miniug fever—a fever, it is said, which has its parallel only in the "South Sea Bubble" and the Tulip craze. But in this African furor there is a substance at its back which the "bubbles" had not, and which has built it up and will carry it on to a greater outcome. This substauce is in the $125,000,000 of gold that has beeu produced iu the past six years, and in the $35,000,000 per annum that is now the outcome of the Witwatersrand alone. The Witwatersrand is entirely foreign to the British South African Co., with its 1890 miles of discovered quartz reefs.

One's imagination can hardly grasp the future of these African gold fields and their effect on the monied centers of the world, particularly so when we consider the question of our perfected mechanical and chemical appliances for the extraction of gold, and also the vast population of the cheapest labor anywhere obtainable which is at hand there.

We in California boast of our gold area and think that we are doing wonders, when in fact we are falliug into the background as a gold-producing State aud in auother year, unless we "brush up," will fall behind Colorado, which has made no pretensions as a gold-producer until within the past five years. From a yearly yield of about $70,000,000 we have fallen off to less than $14,000,000. Of course there is a good cause for the major part of this decline, but when California's gold yield falls below $25,000,000 per annum it is through the action or inaction of her own people. The tirade against hydraulic mining has cost the people of the State a loss of at least $200,000,000 of gold, considering what would have been produced by this class of mining and also in other ventures by the use of this money. In consequence, we have for years been crying "hard times." Is it any wonder when we have cut off one of the great resources of wealth, and which could not be absorbed by railroad tariffs?

The business wealth of California is not in her commerce. We have no great commercial brains. Our grain interest has no future like in the past, as Cauada and India are to supply in the main the English market. Our wine, wool and fruit products are mainly absorbed by railroad greed. What, then, have we to look to for much profit but to work our mines? Our mechanical establishments are comparatively at a standstill and from the simple fact that we allow the East—I may say Chicago—to undersell us, aud deliver the goods in parcels at our very doors. For business, says one, we want more money. Are not our mountains stored up with gold? Why should not the effort be made to take it out? The State has never been so prosperous as when we mined most, and why is not mining the most desirable of all pursuits for California and Nevada? Mining on a scale to correspond with the expanse of our gold fields would soon stop the cry of "no money;" it would cause the fires to be started up in our fouudries, and also give general activity to every branch of trade. The time has come when we should awaken to the fact that while the rest of the world are giving out much of their energy and capital for mining enterprises, Californiaus at least should maintain their past record by doing their part in the opening up of new gold resources, for the good of themselves if not for the world at large. We cry for more money when we have not ouly gold fields, but silver ones as well, seeking the hand of capital, and which would, were it not for the work of selfish bankers, be adding their wealth for the enrichment of mankind. The cry of a lack of parity of the metals is as devoid of force as it is of fact. When we sum up the volume of the two precious metals and give a thought to the output of gold in all the gold-producing countries of the world, we see that unless silver-mining is resumed that metal will soon reach the point of being the one most desirable and useful for business purposes. That there should be a political rebellion on the silver question, every man of figures can see.

The masses, to save themselves from wading in the slough of poverty, must rise and overthrow the force of the banking powers which is arrayed against them. Our upward chances for wealth and comfort are in proportion as we can mine and mint the precious metals, and until this is done in order to get more money, we will have to wade on in our poverty-stricken channels. It is the most simple and comprehensive of business propositions, and why should we not, as intelligent people, act upon it? Europe is even now reviving in monied wealth, drawn from her mines in South Africa, Australia and America, and it devolves upon us as a precious metal-producing country to become enterprising also, by extracting our metallic wealth for use and when this is done we should devise ways for retaining it, which we have been too slack in accomplishing in the past.

Almarin B. Paul.

San Francisco, April 30, '95.

Brickwork Built to Last.

In demolishing a part of the Albert warehouses in Liverpool, belonging to the Mersey Docks and Harbor Board, it occurred to the assistant engineer in charge of the work to make some investigations into the strength of the old brickwork. The wall was built about fifty years ago of hand-made bricks, laid in ground mortar made with Flintshire lime. This lime is in a high degree hydraulic and has a reputation of making mortar of exceptionally good quality. The Journal of the Royal Institute of British Architecture, which describes the investigation, states that the engineer conceived the happy thought of leaving a piece of it in the form of a horizontal beam, having a twelve-foot span and measuring about two feet square in section, seven courses in the height of a two-foot wall. The ends of the beams were not cut free from the rest of the work. This beam was then loaded with all the weight that could be conveniently piled upon it, with no appreciable deflection or other sign of weakness resulting. Two courses were then cut off and the whole weight again put on, but without other result. The beam was further reduced by a course, leaving it four courses, or fourteen inches deep, and the ends were also cut free from the other work—the mortar beds of the twelve-inch bearings being untouched. A centrally placed load of five tons fifteen hundredweight was then gradually piled upon it, and was borne for several days without apparent effect upon the brickwork. Finally the weight was increased to six tons nine hundredweight twenty-three pounds, when the beam collapsed during the night and came down in pieces more like broken timber than anything else. Other tests were made with similarly astonishing results, but the above are sufficient to show what really first-rate brickwork in hydraulic lime will stand.

The gold in the Bank of France increased during 1894 by $71,600,000, and since the 1st of January $16,000,000 more have been added to this, making the total reserve $427,600,000. But the Bank of France does not pay out all its gold on demand, as does the United States Treasury. The ratio in France is 15½ of silver to 1 of gold, and every time that money is demanded of the bank its rule is to pay one-half in gold and one-half in silver. This has not brought France to the silver basis. Both gold and silver are used in the payment of debts. Why should not our Government do what France has successfully accomplished? Our ratio of 16 to 1 ought to be more easily kept at parity than the French ratio. It was the remonetization of silver by the law passed in 1878 that made it possible to resume specie payments in 1879. That resumption in both metals was followed by great prosperity for several years, until, without authority of law, the Secretary of the Treasury made a rule discriminating against silver, and paying debts in gold alone. There would be no trouble in the treasury if the Government should redeem greenbacks or other paper money half in gold and half in silver, as the Bank of France has all the time been doing. That would be also in compliance with the law, as the present practice is not.

Six hundred creosoted telegraph poles to hold wires which pass over the high mountains of Mexico were sent out to Tampico on the British steamship "Benwick," from Philadelphia. The poles were so black with the oil which had been forced through them that they resembled iron in both weight and color. It has been found in Mexico that wood is so rapidly destroyed by tropical birds and insects that it was necessary to inject some poison that would have the double purpose of preserving the wood and preventing the poles from being used for roosting purposes. Copper wires are almost exclusively used, as they have been found to last longer and hold the weight of birds and monkeys, which crowd them at night. Electric Review.

It is reported that thirty-six tons of caterpillars and a large number of cocoons—in all 35,000,000 insects—were destroyed in the effort to drive the pest from the young plantations of trees on Hong Koug Island. They appeared on the pine trees with which the Government is trying to reafforest the island, and lasted for two months. Stations were established where the caterpillars were received aud paid for by weight, and this method appears to have proved as effective as could be desired.

South African Gold Mines.

Prof. Suess, the celebrated Vienna geologist, has compiled data which indicates that the bursting of the South African boom is not remote. He shows that the increased production of those gold fields is deceptive. Whereas the yield of 1894 was thirty-seven per cent above that of 1893, it was obtaiued by the treatment of sixty-three per cent more ore. The following table, giving the yield in pennyweights per ton for twelve of the leadiug mines of the district, shows to what an alarming extent the value of the ore decreases with depth. It must also be remembered that as depth is attained the cost of mining increases:

	1894.	1891.	1890.	1889.
City and Suburban	8	12	15	30
Crown Reef	7¾	10	16½	12
Durban Roodepoort	9½	11¼	18¼	25
Jubilee	10½	16	22	15
Jumpers	8	7¾	6¾	14
Langlaagte Estate	8¼	14	15	22
May Consolidate	6½	9½	14½	20
Robinson	19½	23	30½	52
Salisbury	13½	32	29	37
Simmer and Jack	8½	9	8½	16
Stanhope	9	12	16½	16
Wemmer	10	9	18½	16

In London speculation in South African mining stocks has reached a furor hardly equalled in the century, aud every thinking man knows that the crash cannot be far away. This is to be deplored by the American miner, because while the craze is on nothing can be done with American mining properties in London, and because when the crash comes it will be so terrific that mining will suffer general discredit, and investment will turn to other fields.—Spokane Review.

"They had an original aud effective way of preventing strikes on the Sonora Railroad while it was building," says its first superintendent. "The Mexican peons were queer laborers to deal with, and there were habitual kickers and agitators among them to stir up discontent, like those we find in other more enlightened regions where great works are carried on. The Mexican Government, standing as a backer of the road, was, of course, interested that nothing should interfere with its progress, and so when it was discovered that a man was stirring up trouble among his fellow-laborers, he was disposed of in a way peculiar to the country. Some men were detailed to get him drunk—no difficult task when liquor was furnished free—and he would wake up in the morning to find himself in military barracks, and to be informed that he was an enlisted soldier in the army. All the formalities had duly been gone through with, and he was kept in seclusion in the barracks until he was transferred to some remote part of the Republic. He was enlisted under an assumed name, so that when his friends came to the barracks to inquire after him by name, they were informed that there was no such man there. If they doubted the statement there were the rolls which they might inspect. As the Mexican soldier is virtually a prisoner, and the army is made up to a considerable extent of criminals pardoned under condition of enlisting, no comment would be excited by the keeping a new recruit in confinement, and, off in Yucatan or Tabasco, his friend would not hear of him again, at least during the building of the road."

In foundries it is customary to immerse castings in a bath of dilute sulphuric or nitric acid, in order to remove burnt sand and scale. This process is known as "pickling." The fumes from the acid render this method of cleaning the metal very offensive. Many attempts to use electricity as a substitute have been made, but without success until recently. A plan invented by Dr. A. H. Ramage, of Edinburgh, is now in use in a wire mill near Chicago, aud proves a great success. The objects to be pickled are attached to the anode, or positive pole, which, with the negative pole, is immersed iu a solution of some salt of iron not named. Electrolysis results, and the iron taken off the pickled rods is deposited ou the cathode.

Nearly all the Greenland glaciers and tongues from the internal ice cap terminate in vertical faces from one hundred to one thousand feet high, presenting facilities for investigation. The vertical faces reveal pronounced stratification on the basal ice, even earth materials in the bases carried by the ice being arranged in layers. Fine laminations were seen, twelve to twenty to an inch. The layers are sometimes twisted and contorted, and even "shoved" over each other. The glacier movement at the ice border is a foot per day to a foot per week.

It is proposed to construct a cable railway over the Niagara Falls. Powers have already been acquired from the Canadian authorities, and application has now been made to those of New York. It is intended to erect two steel towers about twenty feet high on each side of the stream and to stretch the cables between them.

The War Department has been obliged to issue a general order warning soldiers against burning their hands in using the new small-bore rifle. The heat generated by firing the smokeless powder is so great as to require caution in handling the piece.

Milling Arizona Gold Ores with a "Colorado" Stamp Mill.

By Willard S. Morse, Prescott, Arizona.

Referring to Mr. Rickard's paper on "The Limitations of the Gold Stamp Mill" (*Trans.*, xxiii. 137), and the discussions that have followed, and without entering into any controversy as to the relative merits of the "California" and "Colorado" types of stamp mills, I wish to give the results obtained on ores from Lynx Creek district, near Prescott, Arizona, with a stamp mill of the Colorado, or, more precisely, the Gilpin county, Colo., type.

The mines of the district have been worked for nearly thirty years, yet in that time, very little, if any, work has been done on the veins below the line where the oxidized or "free" ores end, and the sulphide or "base" ores come in, except in a few cases where the sulphide ore was high enough in value to ship to smelters. The surface or oxidized ores have been worked in arrastras and stamp mills, but few attempts have been made to mill the so-called "base" ores. About thirteen years ago a smelter was built in the district by Mr. John Howell to smelt these ores, but was abandoned on account of the high transportation charges on fuel and bullion.

The saving shown in this paper is not claimed to be high, and the history of the district has been given to show that heretofore, at least, the ores have not been considered suitable for stamp milling.

The ore from which the results are given was extracted from below water line (100 to 250 feet from the surface), and is a quartz carrying zinc-blende, iron pyrites, galena, and a small percentage of copper and arsenical pyrites.

MILL.

The mill is a typical "Gilpin County" stamp mill of ten stamps. No rock-breaker or self-feeders are used, the ore being fed by hand. I do not wish to be understood as advocating this method of feeding. It was adopted as a method of economy in first cost of plant, as the attempt to mill these ores was regarded as an experiment, in view of the history of the district.

The weight of stamps when new was as follows:

	Pounds.
Stem	265
Tappet	35
Head	225
Shoe	85
Total	610

The stamps dropped 15 inches, 36 times per minute, in the following order: 1 5 2 4 3.

The mortars are provided with copper amalgamating plates, the front plate being five inches and the back plate ten inches wide. Both plates extend the full length of the mortar, and have an inclination of 45°.

The outside plates (one for each battery of five stamps) are 96 by 52 inches, silver-plated (one ounce to the square foot). These plates are set with an inclination of 1⅝ inches to the foot.

CONCENTRATORS.

For concentration of the tailings after amalgamation, two Gilpin county bumping or percussion tables are used. The beds of these tables are made of cast iron. The cam-shaft of the table is run at 78 revolutions per minute, giving the table 156 strokes or bumps per minute.

CALCULATIONS.

The calculations presented are based on the following data:

Tailings.—A sample of the tailings running from the mill is taken every half-hour by diverting the entire stream of tailings through a swinging trough, which discharges into a galvanized iron tub. This trough is operated by a cord from the battery. The sample thus collected, containing the proper proportion of slimes and sands, is decanted after completely settling and evaporated to dryness. Two such samples are made daily and assayed, and the results given below are the average of 503 samples and assays.

Concentrates.—The weights, assays and analyses of concentrates given are from smelter returns.

Bullion.—United States mint returns are used for contents of bullion.

Ore.—The assay value of ore has been determined by calculation based on the weight of ore and concentrates and the contents of bullion, concentrates and tailings.

RESULTS.

The following are the results obtained from the milling of 2432.9 tons of ore of an average assay value of 0.763 ounce of gold per ton, which varied in a monthly run from 0.574 to 1.18 ounces per ton.

Amalgam. — Total amalgam recovered, 5711.6 ounces. Of this, 70.2 per cent was from inside battery plates, and 29.8 per cent from outside plates.

Retort.—Weight of retort, 2024.45 ounces, or 35.4 per cent of weight of amalgam.

Bullion.—Weight of bar, 1854.38 ounces. Loss of weight in melting retort, 8.4 per cent. Assay of bullion, gold, .636 fine. Contents of bullion, gold, 1180.148 ounces.

Concentrates.—Net weight of concentrates, 605,149 pounds avoirdupois, or 12.4 per cent of weight of ore. Assay and analysis of concentrates, Au, 1.347 ounces per ton; Ag, 6.93 ounces per ton; Pb, 6.34 per cent; SiO_2, 9.9 per cent; Fe, 30 per cent; Zn, 6.85 per cent. Contents of concentrates, 407.6972 ounces of gold.

Tailings.—Weight of ore, 4,865,822 pounds; weight of concentrates, 605,149 pounds; weight of tailings, 4,260,673 pounds. Assay of tailings: Average of 503 samples and assays, 0.1271 ounces of gold per ton. Contents of tailings, 270.8327 ounces of gold.

CALCULATION OF SAVING AND LOSS.

	Ozs. Gold	Per Ct.
Bullion	1180.1480	63.5
Concentrates	407.6972	21.9
Tailings	270.8327	14.6
	1858.6779	100.0

The highest results obtained by amalgamation was on a lot of 332 tons, assay value of ore 1.134 ounces per ton, which was:

	Per Cent
By amalgamation	76.3
In concentrates	14.1
Lost in tailings	9.6

SIZING OF TAILINGS AND CONCENTRATES.

Mesh of screen used on battery.	Material.	Coarser than 60-mesh, per cent.	Through 60-mesh and remaining on 80-mesh, per cent.	Through 80-mesh and remaining on 100-mesh, per ct.	Through 100-mesh and remaining on 150-mesh, per ct.	Through 150-mesh and remaining on 200-mesh, per ct.	Finer than 200-mesh, per cent.
30	Tailings	5.4	3.9	15.6	12.3	11.	51.8
30	Concentrates	2.8	2.4	7.8	16.	19.4	51.6
40	Tailings	6.6	5.	10.8	13.6	6.8	57.2
40	Concentrates	1.9	1.1	5.9	16.5	22.1	52.5
60	Tailings		2.	3.	14.5	9.5	66.
60	Concentrates		2.	3.5	10.4	30.	58.2

Tests made by panning weighed quantities of tailings and weighing and assaying the concentrates thus recovered, showed that about 60 per cent of the gold lost in tailings could be accounted for in this way. The concentrates thus saved, however, invariably assayed much lower than the average of the concentrates that were saved on the concentrating tables, and were very fine, 90 per cent passing through a 200-mesh screen.

Sized samples of concentrates, each size assayed separately, invariably show that the finer concentrates assay less than the coarser sizes.

The following results on a sample of concentrates assaying 1.8 ounces of gold per ton will serve as an illustration of one of many such experiments that have been made:

SIZE AND ASSAY OF CONCENTRATES.

Size—	Assay.
Coarser than 60-mesh	Ounces gold per ton— 2.6
Through 60-mesh, remaining on 100-mesh	2.2
Through 100-mesh, remaining on 150-mesh	2.2
Through 150-mesh, remaining on 200-mesh	2.
Finer than 200-mesh	1.5

CONCLUSIONS.

From more than eighty assays made on specimens of the various characters of ore found in the district, the following conclusions have been arrived at:

1. That the gold is contained in the quartz and "free," or else is associated with the iron, copper or arsenical pyrites, and that a large percentage of that, associated with pyrites, can be extracted by amalgamation with very fine crushing.

2. That the zinc-blende, as a rule, carries very little gold value, and that in cases where any considerable quantity of gold has been found in the blende, it was very "free," and easily extracted by amalgamation after fine crushing.

3. That the galena, as a rule, assays low in gold and high in silver.

NOTES.

Screens.—Forty-mesh burr-slot screens are used as a rule, and last about three weeks.

Shoes and Dies.—Cast-iron shoes and dies are used, and the actual wear of iron per ton of ore is: for shoes, 1.122 pounds; for dies, 0.692 pound.

Crushing Rate.—The average crushing rate of the mill for nine months, based on actual running time, is 3355 pounds per stamp per twenty-four hours.

Water Used in Battery.—Water used in the battery, 21,000 gallons per twenty-four hours, or 1252 gallons per ton of ore crushed.

RESULTS ON ORE HIGH IN ZINC.

The results on a small lot of ore selected for high zinc contents may be of interest.

The assay and analysis of the ore are calculated from contents and analysis of concentrates and tailings, weight of ore and concentrates and contents of bullion.

Ore.—Assay value of ore, 1.393 ounces of gold per ton. Analysis, Pb, 2.90; SiO_2, 59.0; Fe, 8.8.; Zn, 9.7 per cent.

Amalgamation.—The ore yielded by amalgamation 0.9 ounce fine gold per ton.

Concentrates.—One ton of concentrates was made to 3.8 tons of ore. Assay and analysis of concentrates: Gold, 1.54 ounces; Pb, 7.4; SiO_2, 9.8; Fe, 21.6; Zn, 19 per cent.

Tailings.—Assay and analysis of tailings: Gold, 0.12 ounce; Pb, 1.3; SiO_2, 76.6; Fe, 4.3; Zu, 6.5 per cent.

From the above data the following calculation is made:

	Contained in Bullion.	Contained in Concentrates.	Contained in Tailings.
Gold, per cent.	64.5	29.1	6.4
Lead		67.	33.
Zinc		51.	49.
Iron		64.2	35.8
Silica		4.4	95.6

* Read at the Florida meeting of the American Institute of Mining Engineers, March, 1895.

Prospector's Horn Spoon.

The Grafton correspondent of the Chloride, New Mexico, *Black Range* says:

"Dick White, who is an old California gulch miner, has been showing the prospectors and miners here how to make a great horn spoon with which to test pulverized gold ore or placer gravel and sand. The spoon Mr. White made was an extra good one and was manufactured after the following manner: A large horn is taken, boiled, shaved to an even thickness, the tip cut off, as it is useless, split and then screwed or nailed while it is hot and yielding over a wooden form or mold and allowed to cool and dry for a day or two, and then taken off the mold and scraped or sand-papered and polished on the inside. The prospector or miner then has a light and portable instrument in which to test pulverized ore or placer dirt, which will hold about a quarter of a pan. Dick says the best great horn spoons, or in fact any horn spoons, great or small, can be made from the horn of the male bison, commonly known as the buffalo; or, in case a bison horn cannot be obtained, the blackest horn of a bull or ox which can be got is the next best. The black bison horn shows up the yellow gold by contrast best, and takes the highest polish."

Thought the "Clermont" Was Perfect.

Peter Cooper was one of the invited guests of Robert Fulton on board the "Clermont" when, on her trial trip, she first ploughed the waters of the Hudson by steam—waters which have since been and are now thronged with what are among the most splendid steamboats in the world. Cooper used to tell a story to the effect that there were refreshments and speeches on board; and one of the speakers, after referring in very appreciative terms to the boat, said that, fine and magnificent as she was (she was 133 feet long, 16½ wide, flat-bottomed, straight-sided and with full bows, decked only at the ends and with boilers and machinery exposed amidships), she was probably only the germ of practical steam navigation, and that much finer and faster boats would certainly follow her. At this point Fulton called upon the speaker to sit down, telling him bluntly that he knew nothing of what he was talking about.—American Machinist.

Paper possesses excellent insulation properties, and is therefore available for the manufacture of electric cables and similar articles, says an exchange. During the past several years paper has been used quite extensively in connection with the making up of telephonic cables. Rubber, which is generally employed, is expensive. For instance, the cost of a foot of rubber-insulated cable, such as is needed for ordinary purposes, is about $3.25, whereas the paper-insulated cable, of equal build and effectiveness, can be had for less than $1 per foot. Engineers have put the paper-insulated cables through severe tests with results quite satisfactory.

One of the paradoxical things about people is that they always think times will be better if prices are high, and yet every mother's son and daughter laments bitterly whenever that prayed for advance results in their getting less for their dollar than they got before. They do not seem to be quite sure whether it is prices or things they want in this life. A little study in economics would show them that the ideal condition to be sought is that in which they will get the most things with the least effort. The progress of wages is not alone in increasing the number of dollars, but in enhancing the purchasing power of the dollars they get now.

They do not think anything of an egg in China, it seems, until it is about one hundred years of age, old eggs being worth as much in that country as old wine is elsewhere. They have a way of burying the eggs, and it takes about thirty days to render a pickled egg fit to eat. Some of the old eggs have become as black as ink, and one of the favorite Chinese dishes for invalids is made up of eggs, which are preserved in jars of red clay and salt water, consequently there is not much pleasure in being an invalid in China until you have had plenty of training.

According to a recent legal decision reported in the *Timberman*, hard wood is "any tree that has a leaf as distinguished from a needle." A man contracted to deliver to a railroad hardwood cordwood, and he delivered poplar in part fulfillment of the contract. The railroad rejected this as not hardwood, and sued, but the contractor won the case on the decision of the court.

The Chinese divide the day into twelve parts of two hours. The Italians reckon twenty-four hours round, instead of two divisions of twelve hours each, as we do.

To obtain a greater amount of power from belts, the pulleys may be covered with leather. This will allow the belts to be run very slack, and give more durability.

The MacArthur-Forrest Process.

SAN FRANCISCO, April 29, 1895.

TO THE EDITOR:—You will observe, in the judgment rendered by the Appeal Court in London, that the judges decided that "the selective action claimed by the plaintiffs and the application of a very dilute solution, containing an extremely small quantity of cyanide of potassium, to ore containing gold, has, in our judgment, been proved." Now this very dilute solution (never exceeding two per cent of cyanide of potassium) is one of the special and distinctive claims of the American patent; therefore, had the trial taken place in this country upon the American patents, our company would have won their case, and this decision is a most important one, in view of the suit now pending with the Mercur Company and others.

Therefore I would ask you to kindly insert this letter in your valuable journal that it may be generally known throughout the country.

Faithfully yours,

THE GOLD & SILVER EXTRACTING CO. OF AMERICA, L'D,
Per P. GEORGE GOW, Agent.

The Denver *Republican* says that cyanide promises to become a prominent factor there; and the erection of plants in many parts of the State to employ it in the separation of gold from the quartz means much for the mining industry of Colorado. Two large plants are nearing completion at Florence, there is one in operation at Cripple Creek, one has been running for several months in Boulder county, and another will be completed in that section in a few days.

"The formation of a company to build a plant in Leadville by men who have heretofore adhered closely to the smelting business is one of the signs of the times which cannot escape notice. Edward Eddy, James B. Grant, W. H. James, Guy C. Barton and E. W. Nash of the Omaha and Grant Smelting Company, in association with John F. Campion, A. A. Blow, T. W. Goad, have incorporated to build at once a plant to handle 100 tons of the oxide ores of Leadville a day, and with the intention of increasing the works later to a daily capacity of 300 tons. Mr. Eddy is president and Mr. Grant vice-president of the company. The capital stock is $100,000.

"The same gentlemen in their contract with the MacArthur-Forrest Company, for the use of its patents, have secured the right to establish plants elsewhere at their discretion, which practically gives them control of the entire United States rights of the cyanide process owned by that company.

"One of the directors of the company estimates that fully one-fourth of the gold being produced in the world to-day comes from cyanide plants. There are many large works in South Africa using the process, and one of them is taking out nearly 60,000 ounces of gold a month. So far in Colorado the production has been small; but the completion of the works, now in course of construction, should add largely to the output of the State and from ores that cannot be profitably mined and milled by the more expensive methods. The cost of treatment by cyanide ranges from $2 to $4 a ton. The chemicals cost about $1 to the ton of ore treated."

Mining in Mexico.

H. F. Collins, who has been in Mexico for about six years, engaged chiefly in copper mining and smelting, tells the London *Mining World* what he thinks of Mexican mining in general and of its English record in particular. He says Mexico has not had a fair chance. English companies have been unfortunate in getting hold of wrong properties, or in trying to work them with insufficient capital.

The Americans are getting the cream of the mines. They are more judicious in their selection, and are not afraid to spend money when they have made up their minds that they have a good thing. The English have not employed the right sort of men to select and work their properties. The right sort of man would be one who knows Mexico in the first place, who is accustomed to work there in the second, and who is thoroughly familiar with Spanish. He must also know the local conditions, which very often go to make all the difference between a grand success and an awful failure. The men sent out are frequently ignorant upon all or most of these points. Often mere office men have been sent to take charge of great businesses, and when they come to grief their employers have expressed surprise; but those who have seen them on the spot would have been surprised had it turned out the other way. At other times the English companies have sent out men capable enough in their own way, but absolutely ignorant of the country and of the language; and everybody knows how unsatisfactory it is to manage a property through an interpreter. Then, again, the wrong process of treating the ore has been adopted. Amalgamation and lixiviation processes have been adopted for ores which ought to have been treated by smelting, with the result that a large proportion of the precious contents is lost, and what has been recovered has only been at a prohibitive cost. Water is generally scarce, and that is why amalgamation and lixiviation processes have often been comparative failures. Natural fuel, also, is rather scarce, but the extension of railways throughout the country is rendering it easier every day to introduce coke, which is the best fuel for the purpose.

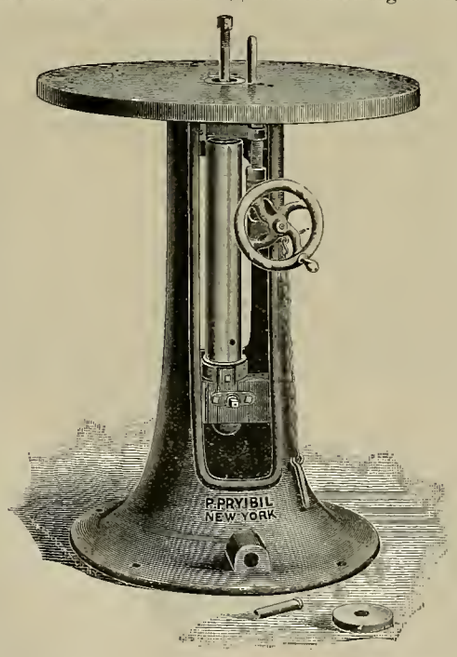
The price of silver does not affect Mexican mining, except as regards the payment of salaries on a gold basis to the English employes; the purchase of materials and plant in a gold-using country, such as England and America, and in the remittance of profits. As regards all the rest of the working expenses—labor and local materials—it does not matter, as you pay in silver, and there is free coinage of silver. Your produce is turned into dollars, and the dollar is the dollar's worth. This amounts to a large premium on silver mining in Mexico, as against silver mining in gold-using countries like the United States and Australia. Therefore, given two deposits of equal richness in Mexico and Australia, the Mexican deposit has an enormous advantage, and profits can be paid where, in Australia, expenses would hardly be met. These are points not commonly understood by English investors. True gold ores are comparatively rare.

If foreigners expect to do their work in an overbearing way they have difficulties with the authorities, but if they are content to act courteously and to conform to the usages of the country, no difficulty will be found. It is quite the exception for bribes to be given. If you go to the courts with a just case and with a respectful demeanor, you will get satisfied. Even if you are defeated in the local courts you can get the matter readjusted at the superior ones. There are no exactions put upon foreigners, for the desire of the Government is to introduce more capital. Mexico is in a fairly satisfactory condition from the mining point of view, but few good mines are in English hands. The Americans have been more successful, particularly in the State of Chihuahua, in the north. Perhaps this is the richest of all the States, and it is being opened up almost exclusively by American capital, and with good results. Still, there are many rich silver properties lying idle for want of capital.

The ores are not refractory to modern smelting processes, but they were so to old Mexican milling. As to labor, in the north it is unreliable and not always easy to get; but in the south it is more plentiful and the men work better. They get a lower rate of wages, and the work they do also is of a low standard. Relatively, labor is not so cheap as would appear from the very low rate of wages.

Single Spindle Edge Moulder No. 1.

Herewith is illustrated a small reverse-motion machine, with a circular iron table thirty inches in diameter and a circular iron body. The spindle is in the middle of table and body, and is of steel, resting on a steel step in an oil well. The bearings are long and self-oiling, each cap being provided with an oil chamber filled from the top, and containing a wick



in contact with the spindle, and extending nearly the whole length of the bearing. Each cap being adjustable by a single central screw, can be brought to a uniform bearing with the greatest ease. The bearings are connected by a frame with which they are cast in one piece, and by which they are maintained perfectly in line. This frame, together with the spindles and bearings, can be raised or lowered by a hand-wheel placed just below the front of the table. A counter-shaft with self-oiling tight and loose pulleys, a belt-shifter, a wrench, two reducing rings for hole in table and three sets of collars for spindle are furnished with each machine.

Parke & Lacy of this city are the coast agents.

Coast Industrial Notes.

—The Scow Bay Foundry, at Astoria, Oregon, has resumed after a long idleness.

—The Sacramento trustees are still playing with the bids for the proposed pumps.

—Wells, Russell & Co. have this week sent nine wooden tanks to the Harqua Hala mine—six 20 feet in diameter and three 15.

—The Southern Pacific Co. has made a rate of ninety cents per 100 pounds on canned salmon from Astoria, Or., to New York and common Eastern points, via the Sunset route.

—The whaleback City of Everett makes the round trip between San Francisco and Comox, B. C., a distance of 1800 miles, in less than nine days. She carries 5000 tons of coal.

—From St. Paul, Minn., comes the story that the Great Northern and the Northern Pacific Railroad Companies are to be consolidated under the management of Jim Hill of the former.

—A cedar tree 407 feet high and seventy feet in circumference was recently felled near Ocosta, Wash. The first limb started sixty feet from the base and was seven feet in diameter.

—The Risdon Iron Works has an order for a 16x42 engine from the Merced Gold Mining Syndicate, of Coulterville. The engine is of the latest pattern and equipped with steam brakes and steam clutches.

—When the Coast and Geodetic steamer Hassler was up for sale on the Sound last week Captain John Irving, of Victoria, B. C., made the highest bid, $5250. The Government has refused the bid on the ground that Irving is an alien.

—Receiver Oakes of the Northern Pacific R. R. says that the shortage in the accounts of the late Paul Schulze, who committed suicide a short time ago after being removed as land agent of the company, will reach somewhere between $100,000 and $250,000.

—A company has been organized at Fresno to put in a telephone system in opposition to the Pacific Telephone and Telegraph Company. It is proposed to reduce the charge to $2.50 a month and use the system now being introduced in San Jose, Santa Cruz and Stockton.

—The Pacific Mail Steamship Company has received a renewal of the contract with the Costa Rica Government to carry mail. The contract is for an annual subsidy of $12,000 (Costa Rica currency) from March 14, 1895, to April 8, 1898. The steamers will touch at Punta Arenas three times a month going north and south.

—The Interstate Commerce Commission has granted railroads terminating in California, and their connections, authority to make a lower rate on oranges to the Atlantic seaboard cities than to intermediate points, enabling California growers to market their oranges on the seaboard in competition with imported oranges. The old rate was ninety cents, the new sixty.

—The Rio Verde, Arizona, Canal Company will utilize the water power of their canal, now being completed, for the generation of electric current. There will be four power stations along the canal line, capable of furnishing, at an ordinary flow, 7000-horse power. The first power house will be built about three miles from the Union mine, nearly eighteen miles north of Phœnix, and will alone supply 4000-horse power, the water of the canal falling forty-seven feet there.

—The Alameda and San Joaquin Railroad Company have incorporated to construct and operate a road thirty miles long in Alameda, San Joaquin and Contra Costa counties. The proposed road begins near the coal mines of the San Francisco and San Joaquin Coal Company in Alameda county and runs to a point on the San Joaquin river and near the dividing line between San Joaquin and Contra Costa counties. The directors are: J. Treadwell, R. I. Fry, E. B. Pond, J. D. Brown, B. M. Bradford. Capital stock, $500,000; $30,000 subscribed.

—The machinery and plant for the fish-oil and fertilizer works, established near Pillar Rock, Washington, are in operation. The process is the same as is used by the Preston Fertilizer Company of Brooklyn, New York, which has the largest oil and fertilizer works in the country. The right of this process for Oregon and Washington has been secured, the plant costs $25,000, and has a capacity of sixty tons of offal per day. The offal will be daily gathered up from twenty of the principal canneries on the Columbia river, and during the season will amount to about 4000 tons.

—The Pelton Water Wheel Co. report a good deal of activity in their business, their orders covering a wide range of country. Among their recent shipments may be mentioned a 200-H. P. wheel for the electric light station at Kyoto City, Japan; a 700-H. P. wheel plant for an electric station in Guatamala; a 1000-H. P. plant for an electric station in Brazil; three wheels for the Majores mines in Mexico; five wheels for the new Hayward & Lane mill in Alaska; one wheel for the Ben Lomond mill in Santa Cruz county; two wheels for the South Yuba Water Company; also a Gates crusher for the Golden Cross mine, of a capacity of 900 tons per day.

Personal.

LOUIS JANIN is examining the War Eagle and other mines at Trail Creek, B. C.

B. J. VIVIAN has been appointed foreman of the West Harmony mine, Nevada Co., vice A. Ohmert, resigned.

W. WESTON, M. E., is warmly endorsed by the Colorado press for the position of State Commissioner of Mines of Colorado.

W. C. RALSTON, secretary of the California Miners' Association, has returned from Europe and is now in Washington, D. C., aiding in the work of protecting the mineral area of the State from railroad absorption.

HARRY WEBB left this week for South Africa to go on the metallurgical staff of the British South Africa Co. It is stated that he will receive a salary of $15,000 a year. Mr. Webb is a graduate of the mining school of the State University.

REV. DR. WILLIAM H. FURNESS, who eighty-three years ago witnessed the launching of the United States frigate Constitution, one of the first war vessels built for the United States Navy for the War of 1812, was an interesting figure at the recent launching of the St. Paul at Philadelphia.

Obituary.

FRANZ POSEPNY, the distinguished Viennese mineralogist, died at Bergrath, Austria, on March 27th, in his 60th year. Readers of the PRESS will recall his recent fine treatise on the "Genesis of Ore Deposits," which elicited deserved praise in this country and Europe.

MAJ.-GEN. JNO. NEWTON died at New York in his 73rd year last Wednesday. As a military leader he distinguished himself on the field of battle; as a civil engineer his name is crowned with success. He commanded the First Army Corps at Gettyshurg, and as commander of the Fourth marched with Sherman to the sea. He successfully solved the problems connected with the adequate improvement of the harbor of New York, and in many difficult engineering matters his advice and co-operation were often sought.

Scientific Progress.

Science and Gold Extraction.

There is an idea prevalent that technical science is rapidly bringing processes of gold extraction to such perfection that almost the ultimate portion of value can be obtained by methods as rapid as they are ingenious. The suggestion is frequently made by writers in the press that a mining district, a chamber of commerce, a State or even a National Government, should offer a large reward for the discovery of a new process suitable to the treatment of complex ores. It is hoped that some heaven-sent revelation will be vouchsafed to some dreaming metallurgist which will revolutionize all pre-existing methods and get 100 per cent of the value contained in the poorest and most perverse of gold-bearing material. Such ideas, such dreams, are all opposed to experience and contradictory to the teachings of the pages which tell the progress of metallurgical art. Evolution, and not revolution, is the keynote of technical science, as it is the clue to physiological development. Processes are born every day, but their mortality is depressing. The examination of the history of the standard methods of ore reduction indicates very clearly that it is in the gradual improvement and extension of established processes and in their adaptation to varying conditions that there will be found the readiest and and safest road to excellence of metallurgical treatment. The cyanide process, for instance, has been the subject of chemical investigation and practical application for six years, and it is yet an imperfectly understood and only a partially successful method Chloriuation was introduced in California in 1856; it has undergone gradual improvement during forty years, but it is still spoken of as a young method of ore reduction. — T. A. Rickard in North American Review.

The Animal Viewed as an Engine.

One of the greatest problems to which the attention of modern experts in mechanical engineering has been directed is this: How shall a larger proportion of the energy known to be stored in fuel be obtained for industrial purposes? Enormous waste attends every process of conversion into mechanical power yet tried. The problem has been attacked on a new side and in an interesting manner by Professor R. H. Thurston, of Cornell University, one of the highest American authorities in this department of science. In animals and man we see substances containing very much the same chemical elements as coal taken into the system, subjected to processes resembling combustion, and finally imparting strength wherewith a certain amount of work is done. Careful investigation shows that the best steam engines show an efficiency of only 20 per cent; that is to say, the actual work performed by them under the most favorable circumstances is just that fraction of the possible power represented by the heat which is taken into the water from the furnace. But in the human machine about 23½ per cent of the energy latent in the average food supply is realized in the day's work of an active laboring man. The internal operation of the system, circulating the blood, pumping air into and out of the lungs, and performing other labors, may perhaps double this estimate. Professor Thurston says, while if the output of nerve and brain power be included in the calculation, perhaps the total efficiency would be between 50 and 60 per cent. This is nearly three times the best showing of a steam motor. The mysteries involved in this superiority, therefore, may well tempt the keenest and ablest engineers more strongly than the physiologist to further investigation.

There are recognized in the arts only three methods of developing mechanical power—by heat, by electricity and by chemical action. Professor Thurston shows at great length that the vital machine is not a heat motor. Upon this point he has no doubt. Though instructions are sent through the nerves of a highly organized animal to its muscles by what seems to be an electric current, this latter performs but an insignificant amount of physical labor. And in man and the horse, for instance, there are no special organs for the production of electricity as in the electric eel. Hence it seems highly unlikely than the animal is an electro-dynamic machine. But its similarity to a chemico-dynamic motor is obvious. In the particular muscle or organ which is telegraphically directed to do something, fats and glucose which have been stored therein are transformed into carbonic acid gas and water. The phenomenon is akin to the firing of an explosive in a distant mine with an electric current. The power in every case seems to be manufactured on the spot, and not to be transmitted from a central station. Each organ and cell, then, is a motor by itself. Further evidence that the nerve-impulse may be electric is found in the fact that a real electric current can be made to produce an identical effect upon the muscles. Nerve energy, like brain power, is subject to exhaustion, and appears to be derived in some way from the daily food, although its source and the method of its development cannot be detected. But inquiry on that point, fascinating and important as it must be to the biologist, the physician and every promoter of the highest civilization, is not likely to yield results of such practical value as the solution of another problem: Is the transformation of fats and starches into carbon di-oxide and water, which accompanies muscular action, a direct or indirect change? If this secret could be revealed and applied to industrial uses successfully, a tremendous revolution would be wrought in mechanical engineering.

One of the most remarkable of recent inventions is a process for making caustic potash and soda out of brine. It has been discovered that these alkalies may be obtained by decomposing brine by means of electricity. The brine is got from salt wells. Sea water would serve, but it is not so good for the purpose because it contains much less salt. Already the manufacture of caustic potash and soda has been begun in Michigan and elsewhere. The matter is exciting great attention abroad, and all the leading chemists of the world are working at it. The inventor of this process is a Belgian named Hermite. In Europe engineers are undertaking to disinfect cities by the use of this process. All that is needed is to run wires from a dynamo into a vessel of sea water, and the latter yields a product which is the same thing as what is commonly known as "bleaching soda." The stuff is so cheaply obtained that it is being used to purify sewers and is poured into gutters. Eventually it will be extensively employed in the sprinkling of streets. By this means of wholesale disinfection, which signifies the destruction of disease-producing germs, cities will be rendered much more healthy in future.

For the past forty or fifty years the geographers and astronomers have suspected that, on account of a "tilting" in the earth's axis, the latitude of all places on the earth's surface is gradually changing. A few years ago (1892) the astronomers decided to make a "test case" of the matter, and now report that the theory is correct. For example, they have proven that Berlin was fifty-one feet nearer the pole in September, 1892, than it was in March of the same year. If Peary and Wellman will only be patient, the pole will come to them.

It is suggested that sounds too high for our ears would be recorded by the phonograph, and might be made audible by reproducing at a lower speed of the instrument.

The new photograph of the heavens, now being prepared by London, Berlin and Parisian astronomers, shows 68,000,000 stars.

Mechanical Progress.

The New Gunboats.

The Board of Naval Bureau Chiefs is considering the designs of the six composite gunboats authorized to be constructed by the last Congress. It was the intention to make these new vessels midway in size between the "Petrel" type and the "Machias" class, so they were fixed at 973.6 tons displacement, one purpose in keeping them just below 1000 tons being to permit of the assignment to their command of energetic junior officers who might aspire to command larger gunboats and cruisers. Since the size has been agreed upon, however, there have been shown evidences of a disposition to reopen the subject and build two large and two small boats, the latter especially designed for use in the upper Chinese rivers, but it is improbable that this scheme will prevail, as the necessity for American gunboats in such waters is not apparent in time of peace, and they could not pass forts in time of war.

The boats have been given a spread of canvas of 11,000 square feet. It would be desirable to give them more, but this could not be done without infringing upon the space otherwise needed. This amount of canvas practically makes the gunboats full-powered sailing crafts, and in this they will be much different from any other of the vessels of the new navy.

The Construction Bureau has adopted this view in consideration of the peculiar service for which these vessels are destined on foreign stations, where they may be safely placed instead of larger ships, in the interest of economy, and will thus often be in places where coal is difficult to obtain. For service in Samoa, in the Gulf of Mexico, and in the Caribbean sea, and on the expensive Bering sea patrol, where speed is not an object at all times, the Chief Constructor holds that sail power will make the vessels of great value, and that they will be the most economical cruisers of the navy.

The Warship Chicago.

When the United States steamship Chicago goes out of commission at the New York navy yard she will have been practically retired from the navy service for at least two and perhaps for three years. It is the intention of the Secretary of the Navy to modernize the ship in every respect, and while the necessary changes would occupy many months under ordinary conditions, the particular work will be long drawn out because of lack of ample funds to carry out the project. At the last session of Congress an appropriation of $200,000 was secured to continue the work on the new engines of the vessel, which will be built at the New York navy yard.

Some of this work has already been executed, but the appropriation is entirely insufficient to complete the new machinery, which will cost about $500,000. It is the design to put in new boilers, including some of the new tubulous type, and new engines, and if all necessary funds were available this work would consume at least eighteen months. In addition to this, extensive changes are to be made in the battery of the ship, and the six-inch guns are to be replaced by five-inch rapid-fire guns. The Ordnance Bureau has no money at present to do this, being under the necessity of practically closing up the gun shops at the Washington navy yard, owing to the failure of Congress to provide the necessary appropriations. Then the contractors have a great deal of work to do on the Chicago, including a complete change of the rig of the ship, and they also have no money for this purpose. So all three of the bureaus must look to Congress at the next session to supply the means to prosecute their work, and as the funds will not be available before July, 1896, and the work once begun will require a year or two for its completion, the prospects are that the Chicago will have a long rest after the hard services she has had during the past ten years.

The naval engineers are about to begin an interesting set of experiments on boilers, which will probably determine the type of boilers to be placed on the Chicago. The large lake steamer Northwest, built at Cleveland, has been placed at the disposal of the Navy Department by the owners, for an exhaustive test.

As illustrating the loss of fuel which may arise from improperly banking fires under steam boilers at night, the *Electrician* cites an instance in which it was the practice to bank the fires at 6 P. M., and close the main damper of the flue, leaving the fire-doors open. The boilers were of the water-tube type, and at the time of banking carried 100 pounds steam pressure. The main damper was not perfectly tight, and sufficient air was drawn in to cool the boilers until the pressure had fallen to ten pounds, when the fires were opened at six o'clock the next morning. Subsequently the practice was changed by closing the fire and ash doors, and by also closing hand-dampers in the flues, which were found to be tighter than the main dampers. As a result, the steam pressure in the morning was invariably found to be at least forty pounds, and the bank of coals, which under the previous condition was more or less consumed, was apparently in the same condition as when the fire was first banked.

While it is true that good bargains may be sometimes made in the purchase of second-hand machinery, these cases are exceptions and not the rule. Most of the second-hand machines offered for sale are for the purpose of supplying their places with new and improved ones; and although such machines may to all external appearance be in good working order, the purchasers generally find out when it is too late to repent that they have made a mistake in their purchase, and the machine, although it may turn out good work, is not capable of turning out a sufficient quantity in a given time to enable him to successfully compete with his neighbors in the same business. The rapid improvements that have been made in all kinds of mechanical devices within a few years render it reasonable to expect that machinery, whether for working wood or iron, built ten or fifteen years ago, cannot possibly have the same improvements as those of recent manufacture.

A great deal has been published in engineering journals about scale in boilers, and yet very little has been said about the accumulation of it in feed and blow-off pipes. There are men who maintain that scale cannot accumulate in pipes in which the water is circulating constantly, or nearly so, as in the case of feed pipes and external and internal circulating pipes, but cases cited will show how fallacious such opinions are. As a matter of fact, these pipes often fill up in a remarkable way, the deposit choking them to such an extent that it becomes a source of positive danger.

The best preventive of warping bars is a cool ash pit. The best bar made can be speedily destroyed by allowing a pile of non-conducting ashes to accumulate in the ash pit, and then throwing down a layer of incandescent fuel on them to radiate its heat upward on the bars, and to heat the incoming air so that it cannot keep the bars cool. A clean pit with a couple of inches of water on the bottom will do wonders in the way of keeping the grates in good condition.

If a belt will not run a machine unless it is as tight as the strings of a bass viol, then it is time the pulleys were changed for broader faced ones, and a wider belt put in place of the narrow one. A belt of the proper width to perform its work with ease can be run on by hand as easily as it can do the work required of it.

Electrical Progress.

Insulating With Asbestos.

Enormous quantities of fine copper wire are used in constructing dynamos and motors. It is necessary, however, before this wire is wound into coils, that it shall be coated with some insulating material so as to compel the electric current to go from end to end, instead of escaping laterally. In practice this insulating material is a knitted web of cottou. But when at work, especially if overtaxed for a few minutes, a dynamo or motor will often develop considerable heat in the coils. Their effect cauuot hurt the copper, hut it may easily ruiu the cotton. By destroying the iusulation in this manner one can ruin the whole machine in a very short space of time, involving not only a loss in the investment, but also paralyzing important industrial operations for hours or days until the damaged device can be replaced with a new one. Builders of electrical generators and motors aim to avert overheating by adapting the proportions and mutual relations of the several parts of these machines to the work they are expected to do, and with the aid of automatic regulators and other means the intelligent user tries to avoid subjecting them to undue loads. But while the evil complained of is of less frequent occurrence now than formerly, perhaps it has not been effectually overcome.

It has been proposed to deal with this trouble by covering the wire with an incombustible material, which shall at the same time be a non-conductor of electricity. Asbestos, a fibrous mineral substance, meets these requirements admirably. Cloth for theater curtains and mittens for workers in iron and glass have been made from it, but it is a difficult and costly matter to draw it out into a fine and even thread suitable for weaviug it into a thin fabric. A coarse one is undesirable, since it would add greatly to the bulk of the coil, to say nothing of the cost of the extra raw material. But it is announced that a Providence, R. I., man has succeeded in adapting asbestos to this use, and has taken out patents on his methods. The Providence *Journal* declares that the thickness of the thread which he obtains from this material "compares very favorably with double-wound cotton." A current that would render a copper wire redhot, and would burn out the ordinary insulating covering instantly, may he used under asbestos without injury. Besides being incombustible, this substance also offers high resistance to the passage of electricity, and thus exhibits the essential quality of a good insulator. It looks, therefore, as if that inveutiou might prove of much valuc, if it does not add seriously to the cost of electrical machines.

Cost of Municipal Electric Lighting.

Prof. W. J. Meyers makes a neat little demonstration in the *Political Science Quarterly* of the fallacies of municipial book-keeping as applied to electric lighting. The report of the superiutendent of the Chicago electric light plant reports the annual cost as $96 per lamp, against $102 per lamp paid by private companies. But an analysis of the figures shows that the superintendent made no allowance for water consumed, nor for interest, nor taxes, uor insuraucе nor depreciatiou of plant. Adding in a proper estimate for these items, the truc cost is shown to be $167 per lamp. This is in line with the results obtained by Mr. Francisco in his instructive examination of the alleged economies of municipal ownership. The economies are almost iuvariahly ou paper merely, and a little figuring will show it.

A BRIDGE which is being built to span the Chuyahoga river at Columbus street, at Cleveland, Ohio, will be uulike anything of the kind ever constructed in this country. The hridge is to be worked by electricity and compressed air. It will have a double swing, the halves meeting at a common center aud locking. The span will be 115 feet long. The material will he steel throughout, and the electric current which will operate the dynamos will he obtained from street railroad wires. The new bridge will swiug in twenty-five seconds. The safety gate, signals, drops, and all auxiliary machinery will be worked by compressed air from the bridge-house, while the bridge proper will be propelled by electricity.

IRRIGATING by electricity is to he given practical test in the San Bernardino valley. The San Bernardino Electric Light Company has arranged an eight-mile circuit to cover the farms and orchards of the vicinity, aud by meaus of stationary pumps and movable motors the water for irrigating purposes will be distributed. The plan is for the formatiou of small districts along the line of circuit, each district to have the use of a motor. It will be attached to a pump a certaiu number of hours, just as irrigating ditches are open for regular periods, theu moviug into the next field counected with the wire, the current turned on, aud each field iu the district served in turn and as the water is needed. The cost of pumping by the electric motors is estimated at $1.15 per month per acre, or less than $7 per acre for the irrigating season at its longest. Water rights cost from $100 to $150 per acre, so that the cost of irrigating hy the proposed method is less thau the interest on the cost of a water right if purchased outright.

A NEW TYPE electric locomotive has been made iu Philadelphia for handling heavy freight and switching. It resemhles the ordinary consolidation type. There are four pair of drivers coupled together by connecting rods. The drivers are fifty-six inches in diameter, the end ones only being flanged. The motors, four in uumber and alternating in position, are of the Continental ironclad type, the field magnetics consisting of two steel castings haviug two field coils placed at the ends of the motors. The motors are wound for 800 volts at 225 revolutions, which equals thirty-five miles an hour. When in multiple each motor will give about 250-horse power, and there will be a constant drawbar pull of over 10,000 pounds. The controlling apparatus in the cab is so arranged that the engineer sits at the right side looking forward, no matter which way he is normally running. The total weight of the engine is about 134,000 pounds.

ARTICLES of iucorporation have been filed with the Idaho Secretary of State of the Salmon City, Lemhi county, Electric Light, Power and Water Company, with a capital of $150,000. The directors are Edward Mingle, W. F. Boxwell Jr., H. E. Ostranden and A. D. Walker of Salmon City, and B. C. W. Evans of Butte. This compauy is to supply electricity, water works and a telephone system to Salmon City and Yellow Jacket, Idaho, and Red Rock, Montana.

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Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
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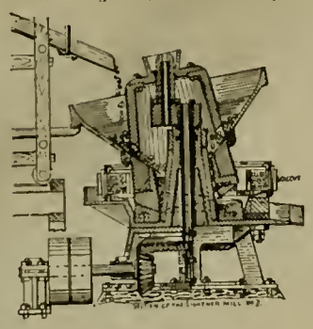

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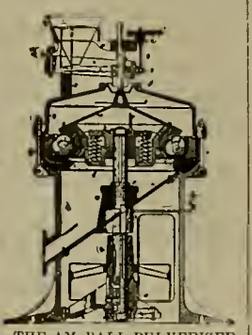

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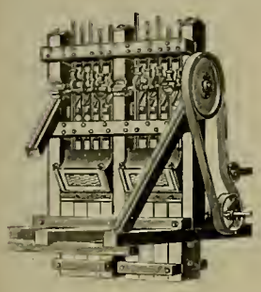

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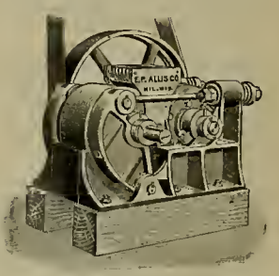

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER DISTRICT.—The Treadwells are prospecting with a six-stamp mill on a ledge of rock upon which they are tunneling, six miles above Sutter on Sutter creek. Wm. Castle has charge of the work for the owners.

Butte.

GENERAL ACTIVITY.—*Register:* Mining in Butte county is returning golden profits to nearly all lucky enough to own a mine in the county. Out at Bangor the Catskill is working the richest gravel ever worked in the blue lead. The famous Banner quartz mine is said to have returned its owners $100,000 above expenses in less than 100 days. The Denver mine has struck a rich body of quartz. The Gold Bank is just what its name implies. The big tunnel is being pushed ahead with great activity, and by fall will be near the rich lode, which can then be worked very cheaply. The Magalia mine will be opened this spring, and this is known to be one of the richest placer mines in all California. The Aurora, Oro Fino and other mines in the Magalia section, will all be taking out gold this spring. At Enterprise all the mines, both quartz and gravel, are paying well. At Oregon City three great quartz mines are being worked. On Wyman's Ravine fifteen men are taking out gold. At French Creek the miners are getting excellent returns. At Cherokee the mines are paying good wages to nearly 200 men.

Calaveras.

THE ESPERANZA MINE.—At the Esperanza the management is pushing the work and by the middle of next month the 20-stamp mill will be crushing quartz. In the new company, Samuel P. Ely, of Cleveland, Ohio, is chief owner.

Inyo.

NEAR MODOCK.—The south tunnel of the '95 mine shows sixteen inches of ore in the face, 130 feet from the surface, assaying $80 in gold 94 ozs. silver per ton. The north tunnel of the Gold Ridge mine has six inches of ore averaging $94 in gold and 153 ozs. silver per ton. Two hundred and nineteen sacks of ore from the last named mine were shipped April 20.

The Inyo *Index* reports that the Caster brothers lately found a $65 nugget in Mazourka canyon.

ARRANGEMENTS CONCLUDED.—Geo. T. Rives has concluded arrangements with the Inyo Canal Company to furnish water for a mine in Inyo that he has sold to St. Louis parties. He will be superintendent of the mine, and will commence the erection of a mill immediately.

Mono.

BODIE CONSOLIDATED.—The yield of the Bodie Consolidated mine for the week ending April 28th was sixteen tons of ore from the workings between the 300 and 400 levels. The estimated value of the ore is about $45 per ton. Will commence crushing ore at the Bodie mill about May 2d. The south drift from the east upraise, 42 feet below the 300-foot level, has been extended nine feet. The ore in the face is from eight to ten inches wide and of good grade. Have started stoping out ore north and south from the above drift. The ore stope from the winze below the south drift from No. 1 upraise, 300 level, is about the same as last reported.

Nevada.

TO BE SOLD.—The Rainbow mine, in God's Country, is to be sold at sheriff's sale to-day, to satisfy a judgment in favor of the men who filed liens on the mine.

THE ENGLISH MOUNTAIN. — Chris. Mallen has gone up to the English Mountain mine to inspect the property. He has been offered the superintendency.

TOO MUCH WATER.—*Union:* The Culverson mine, at Graniteville, has been closed down, the flow of water being so great that the pumps have been unable to handle it. It is expected that new and larger pumps will be procured and until then operations will remain suspended.

WILLOW VALLEY DISTRICT. — The Montana mine was bonded some time ago to Mrs. R. E. Lane, who has eight men at work developing the mine; the prospects are encouraging. The shaft has reached a depth of 400 feet. A steam-power hoisting and pumping plant is on the mine and has a capacity sufficient to admit of sinking 1000 feet.

The Old Home mine, at Blue Tent, has been bonded to F. C. Beckwith, of London, and will be worked.

The Mountain View Mining Company, of Washington, will put up a mill at their mine on Canyon creek.

The Mayflower mine will also put in additional milling facilities.

Plumas.

BUSY AT WORK.—The Quincy Mining and Water Company is reported running three monitors.

Shasta.

A CORRECTION.—Writing from Redding under date of the 1st inst., Mr. W. D. Swezey, president of the Eureka Tellurium G. M. Co., referring to a recent statement regarding rate of wages paid by the company, says: "We pay from $4 per day down to $2.50, which is the lowest price that we pay to any miner."

Sierra.

WILL RESUME.—At a meeting of the owners of the Gold Bluff mine, near Downieville, this week, it was decided to settle the company's indebtedness and resume work. The property was recently attached by John Costa of Downieville and others for $20,000.

THE ALASKA. — The strike in the Alaska mine has proven to be a good one. The Alaska Company has bought the Grizzly ledge, situated near the Alaska, and it is also producing good ore.

SHOWING UP WELL.—The North Fork drift mine is reported "looming up big." The gravel averages $3 per carload—a paying proposition.

Siskiyou.

ON THE KLAMATH.—Messrs. Souger and Dame of Ashland, Or., who have leased the McConnell and Quinn and Pacific mines on the Klamath river at the mouth of Humbug creek, have gotten them almost ready to commence operations. The former mine has in fourteen seasons produced $300,000 and but four of the forty acres have been worked.

MINING NOTES.—*Journal:* At the Empire quartz mine on Empire creek, Klamath river, a twelve-foot ledge has been found, without reaching the back wall, and comprises rich sulphurets paying from $3 to $500 a ton, which are sent to the Selby Smelting Works, on account of not being able to save the gold in the mill at the mine. Mr. Iuuker intends putting in a concentrator to work some of the ore and will send the balance below, or such as will realize a profit, as the cost of shipment amounts to $30 a ton.

The Black Jack and Klamath Consolidated companies, in the Cottonwood mining district, are each working two shifts. The latter company has started its second and third tunnels.

The Espey Mining Company have their surveyor at work running the line for their ditch which, when completed, will carry 1000 inches of water onto the Horse creek mines. C. O. Barlow, who has charge of the work on the Shasta river below Hawkinsville, has completed the foundation and is now at work on the structure for the two water wheels and the thirty-ton pump. James Quinne, who had charge of the work of extending and widening the ditch which is to be used jointly by the Espey Mining Company and the Yreka Electric Light Company, has finished his work and has ready for use a canal carrying 6000 inches.

The Portlaud company which bonded for a short term the W. H. Smith and Brass Wire gulch claims, near Henley, are now working the former claim, which has been opened up to great advantage.

The Omaha and Salt Lake capitalists who bought the big low-grade porphyry dike in the Cottonwood mining district, near the Klamath river, have had another ten-ton sample crushing made at the Jillson mill, with good results.

Austin & Co., of the Greenhorn blue gravel mine, about a mile below Yreka, realized over $1000 for last week's work, the gold being in large grains, with several nuggets of the size of beans.

Tuolumne.

GRAVEL DEPOSIT TO BE WORKED.—A company composed of Sacramento and Tuolumne men was incorporated this week with a capital stock of $300,000 to work 200 acres of rich gravel deposit eleven miles east of Sonora, on the Tuolumne river. Operations will commence at once.

NEVADA.

Storey.

The following are the latest official reports:

CHALLENGE—From top of the joint Confidence and Challenge raise from the surface tunnel a west crosscut was started during the week, which is now out 10 feet; the face shows quartz having no value.

CROWN POINT—The raise from the east crosscut from the south lateral drift on the 700-foot level is now up 49 feet, having been extended 9 feet since last report. The formation on top is the same as last reported. Stopped the south drift on the 700-foot level and started a crosscut from it to the west, 37 feet south of No. 2 east crosscut. It is out 8 feet, and the face is in a mixture of porphyry and clay. No work has been done in the mine since the evening of the 25th ult. From the ore extracted during the week, and from that accumulated in the dumps at the mine, have shipped 657 tons to the Mexican mill for reduction. The average battery for the week was $9.61, of which $8.59 was gold.

BELCHER—On the 300-foot level the joint Belcher and Seg. Belcher south drift is in 180 feet from the shaft; the face shows porphyry. They have hoisted during the week and stored in the ore-house at the mine 43 tons of ore, the average top car sample of which shows an assay value of $17.54 per ton.

SEG. BELCHER—On the 200-foot level the southwest crosscut from south lateral drift is out 22 feet; the face is in porphyry and quartz of no value. Have hoisted during the week and stored in the ore-house at the mine 11 tons of ore, the average top car sample of which shows an assay value of $25.95 per ton.

JUSTICE—The winze from the drain tunnel level between No. 1 and No. 2 chutes was sunk 20 feet, making its total depth 32 feet. This winze is following a streak of low-grade ore assaying from $7 to $10 per ton.

SAVAGE.—In the Savage on the 950-ft. level the north lateral drift started from the west side of the station is advanced thirty-five feet on the vein. The north drift from the east crosscut fourth floor, continues in quartz and porphyry. The south drift from the face of the sill floor southeast drift is advanced 110 feet; face is in quartz giving low assays. On the 1,100-ft. level in the south drift they have started an east crosscut and advanced the same ten feet; face is in quartz and porphyry. They continue to extract some ore on the eighth floor of the old stopes. On the 1,050-ft. level the east crosscut from the fourth floor 300 feet south of the shaft is advanced forty feet. This drift reached the east clay of the vein and was stopped. The west crosscut from the tenth floor of the south ore stoper is advanced twenty feet; face in quartz and porphyry.

CON. VA. BULLION.—The bullion statement of the Con. Virginia mine for the quarter ending March 31st shows total ores worked during the quarter, 3527 tons and 870 pounds; gross yield of said ores, $100,427 36, cost of extraction, $55,912 07; cost of reduction and transportation, $24,692 04; net proceeds, $19,823 25. The bullion tax on the net proceeds amounts to $991 50.

THE DAYTON DREDGING PLANT.—The Carson River Placer Mining and Dredge Company started up its entire plant last week, and is in operation. The concentrating plant on the shore is doing good work and quicksilver and amalgam are being caught in some quantities by the devices in the screening plant. The company will make a lengthy run. About twenty men are employed. Capt. Davis says the working of the plant thus far shows that each concentrator will handle from fifteen to twenty-four tons of this pulp each twenty-four hours, and the pulp or screened sand yields from three to forty per cent. sulphurets. These sulphurets assay from $12 to $150 per ton. All of the factors are continually changing each minute of time that the machinery is running. For the short time in which the plant has been running since its completion, the output was 40½ tons per twenty-four hours, averaging in assay value of sulphurets alone $1,126. The factors for free material, quicksilver and amalgam, vary greatly. They vary from a few cents to several dollars per ton of the material hoisted from the river. The actual practical results can only be determined by longer practical work with complete plant. Thus far the only actual known returns of quicksilver, free material and amalgam have been at the rate of twenty cents per ton for each ton of material hoisted from the river. In many places in the river the returns will go far above this figure, and at other places the returns for quicksilver, amalgam, etc., may go far below and amount to practically nothing.

STARTED UP AGAIN.—The Pittsburg gold mines, eighteen miles southeast of Battle Mountain, which have been idle for two years, started up again on the 1st.

Add Nev

FIVE HUNDRED FEET DEEPER.—The new tunnel in the Wilson mine, near Yerington, will tap the mine 500 feet deeper than the present workings. This will give a new lease of life to the camp.

NYE COUNTY.—Belmont *Courier:* Henry Metz writes from Moutgomery to W. Brougher that the gold mines are looking well in Southern Nye county, and that the company will put up another Huntington mill soon. Within the past month thirty new tents have been pitched in that district by prospectors and miners.

ARIZONA.

"OLD GLORY."—*Star:* J. G. Hilziuger, who has just returned form the "Old Glory" reports quite a boom in mining in that region. Some fine discoveries have been made in a canyon near that mine, and the whole neighborhood is being covered with locations. "Old Glory" is practically shut down, but the company is soon to be reorganized, with an additional $40,000 or so of capital, and then work there will be pushed.

EMBALMED AND SENT HOME.—*Journal-Miner:* J. B. Tomlinson of the Mescal Mining company had the bodies of the miners who were killed by the explosion in the Ohio mine embalmed and shipped to their homes in Colorado at the expense of the company.

AT HARQUA HALA.—*Sentinel:* Ramon Ochoa returned from Harqua Hala Tuesday morning. He said that the Harqua Hala Bonanza mill shut down last Saturday, and the mine of the same name is a thing of the past. Only one pillar of ore remains. Sixty men were discharged on that date and are now scattered in all directions. The tailings will be worked by the cyanide process and will employ a few men for about eighteen months. The mine has been in active operation for the past six years and has produced several millions of gold dollars during that time. The shutting down of the mill was not unexpected for it had been rumored for several months that the ore was nearly exhausted.

THE OLD CROOK MINE.—*Courier:* O. W. Stall and Fred Sattes are working the Alligator mine and mill with marked success. Stull a few days ago brought forty-four ounces of gold from those properties, which was shipped to the San Francisco branch mint. The Alligator is the old Crook mine.

AT EHRENBURG.—The Los Angeles *Times* says: "Lum Gray's outfit, with mining tools and men has started for Mr. Gray's new property at Ehrenburg. The intention is to first develop the property before putting up a mill. Sinking to a depth of a hundred feet will be done on the ledge in two places. Then a tunnel will be put in connecting the bottom of the shafts. This will open up the ore body and show at least one big block of ore to work on—if the ore is there. All proving satisfactory, a mill will then be built, a narrow-gauge road put in to the Colorado, and steamer connection made with the Southern Pacific. Colorado people are interested in the project."

CHANGE OF FUEL.—On the 1st the Arizona Copper Company began using coal as an experiment, instead of wood. This throws out of employment 200 or 300 hurros and their drivers.

A NEW CONCERN.—Articles of incorporation of The Tucson Mining and Smelting Company, with headquarters at London, England, and a capital stock of £20,000 (about $100,000), divided into 20,000 shares, were filed with the Pima county recorder this week.

COLORADO.

BOULDER COUNTY PROSPECTS.—The new mill on the Pine Shade is in operation and is proving a great success in handling the ores from the big ore body. The shaft is now 210 feet deep and the vein has been explored more than fifty feet between walls. Three drifts are run in each level seventy feet long through this mass of mineralized matter, one on the foot and one on the hanging-wall, while the third is in the center of the ore body. The walls are perfect with a streak of talc on them, making it one of the best-defined lodes in the county. Tracks are laid in each opening, and iron cars convey the ore to the shaft, where it is dumped into a skip of 2500 pounds capacity and hoisted to the surface. Every pound of the material broken in the mine is dumped into the mill and averages $10 per ton.

The mill building covers 263 feet in length by sixty feet wide, and is so admirably constructed that everything works automatically from the time the stuff reaches the scales until it comes out pure gold. The mill is built in twelve terraces, as follows: Scales room, machine room, crusher and carpenter shop; 2, ore bin; 3, feeder floor; 4, twenty-stamp batteries; 5, amalgamated copper plates; 6, Gilpin county bump tables; 7, Johnson concentrators; 8, drying room; 9, leaching room, in which are placed four large iron tanks into which the concentrates are put; 10, precipitating tanks (2); 11, refining and assay room; 12, sump tank, into which all the leaching liquids run and are caught, then repumped back to the drying room and used over again. From the time the ore is taken out of the mine until the gold is run into a $2000 brick it is only handled when the cleanup is made. The mill has a capacity of 100 tons daily. There are four batteries of five stamps each, with a drop of eight inches at a speed of 100 drops per minute. The mill is the most perfectly constructed in Boulder county, and is lit up by thirty-six electric lights, which makes the building as light as day. The shaft has also electric lights in it, and is most complete in its equipments. The motive power is furnished by an eugiue of 100-horse power capacity, and a huge tubular boiler. Water is furnished for the mill and machinery from the St. Vrain by two pumps through a pipe line 3400 feet in length, and discharged into a huge tank of 20,000 gallons capacity. A more complete mill from beginning to end cannot be found in Colorado, for it saves a very large percentage of the precious metals contained in the ores. There will be no raw material such as smelting ore and concentrates shipped to the smelters, as the extraction of gold and silver will be done on the property.

A BIG DEAL.—Cripple Creek *Miner:* The Victor, Isabella, Zenobia, Pharmacist, Orphan Belles group and other minor claims and groups of claims, all located on the north slope of Bull hill, have already or soon will be transferred to a French syndicate. The Isabella company own about 160 acres of patented ground, the Orphan Belles thirty-four acres, Pharmacist twenty-one. The Victor is a full claim and the Zenobia contains about eight acres. In all fully 250 acres will be controlled by the syndicate, for which they will pay in the neighborhood of $1,700,000.

SYSTEMATIC MINING.—A remarkable combination of systematic mining operations was recently organized in New York by Clarence B. Richardson. It is proposed to locate 100 gold-mining claims in Colorado. Out of these will be selected ten which have the best surface indications, and upon each of the ten will be sunk a shaft 100 feet deep. Mr. Richardson, who will have the management of the enterprise, is assured of the ablest expert assistance that can be obtained in the country. It is certainly a novel enterprise and does credit to the ability and originality of Mr. Richardson.

INCREASED WAGES.—Notice is posted in Aspen that on and after May 1st the wages of miners who are working for $2.25 will be increased to $2.50 per day.

BRITISH COLUMBIA.

GENERAL NOTES.—The War Eagle shows a breast of eleven feet of ore.

Every discovery in Trail creek is now said to be exactly like the War-Eagle or Le Roi ore.

On April 10th the Le Roi shipped fifteen tons and the War Eagle twenty tons, aggregating $1,750 in value.

The Rio, near the Surprise, Slocan, has been bonded to San Francisco parties. It is high grade dry ore.

The machinery on the Le Roi, Trail creek, will be increased to the capacity of raising 100 tons a day.

A ten-stamp mill is to be started on the Poorman mine near Nelson as soon as the roads are repaired.

The Three Forks concentrator has been shut down temporarily for repairs to the flume. About 400 tons are on hand for treatment.

Good ore is said to be found at the head of Champion creek, which enters the Columbia river sixty miles below the junction of the Kootenay.

The Hall Mines, limited, has called for tenders for constructing an aerial tramway to Nelson, 4½ miles, capable of conveying 100 in ten hours.

A party of gold miners are said to be leaving Buffalo shortly for the Fraser river. Each will contribute $750 to be spent on machinery.

The Consolation mine, Big Bend, is cleaning up about $450 a week. A $50 nugget was taken out a short time ago and in four weeks the total product was $2,500.

The new concentrator is at work on the O. K., Trail creek. The ore is first milled and the free gold taken out, then the tailings concentrated, saving ninety per cent. of the metal.

OREGON.

JACKSON AND JOSEPHINE COUNTIES.

GENERAL NOTES.—W. H. Hamlin has sold his placer mines, near Grant's Pass, for $3000, to Portland men, who are engaged in fitting them up for work.

Some of the placer miners—those mining in dry gulches, etc.—have been compelled to

clean up, on account of the scarcity of water.

Brown & Band have finished cleuning up at the Miller mine, in Farmers' Flat district. They got $2500—a good result considering the short water supply.

Logan, Phillips & Kerschner, who are prospectiug a ledge near Kerbyville, have tested several tons of the ore with un arrustru, and will probubly put in a five-stamp mill.

H. Gendar has some rich rock from the Linchpin ledge on Wagner creek, some of it going us high as $200 per ton. He has an arrastra at work, crushiug ubout two tons per day.

J. W. Virtue, after whom the Virtuo mine in Baker county was named, is prospecting ou the Hanley ranch, in the Applegate country, in the interest of C. J. Eddy of Portland.

The copper mines on Illinois river, Josephine county, which huve lain idle so long, are ugain attracting the attontion of capitalists. A working test of the ore will soon he made, and if it proves satisfactory extensive operations will he commenced.

The Mountuin Lion mine, Missouri Flat district, which reverted to Bailey & Co. somo timo ago, is running on full time.

DOUGLAS COUNTY.

Evans & Clark, who are engaged in prospecting the Elizuheth quartz claims on Mule creek, are talking of putting up a ten-stamp mill. Burt & Tiller have struck it rich on Rogue river, below the "devil's stnirs," und intend to rig upn puup aad work their ground on a larger scale than ever. Mnrks & Co. are running two giants day and night at their mines on Mule creek. They have had considerable trouble with their ditch, hut still stripped an acre and a half of hedrock. Their foreman says thoy are good for an acre and a half more hefore the water quits.

WASHINGTON.

METHOW DISTRICT.—The nuaber of men employed in the various mines in Methow District ure as follows: Saturday employs four men and running two shifts; Friday, two men; Blue Grouse, two; Bismark, two; Lookout, six men und three shifts; California, five; Derby, four and two shifts; London, two; Ransomette, two, Highlnnd Light, four and two shifts; Mountain Lily, two; Hidden Treasure, three; Rising Sun, two; Philadelphia, two; White Swan, two; Small Change, two; Grey Eagle, twelve; Four Aces, six; Tiger, two; Paymaster, two; Gruhstake, two; Diamond Flush, two; Mills, two; Eva, four; Captaiu Hanson, two; Mr. Griggs, five. Besides these there must he twenty-five more at work and at every point of development work the prospects are excellent.

PESHASTIN DISTRICT.—The Blewett Gold Mining Co. are fitting up their twenty-stamp mill with a view of starting up the mill about the first of May. They have now about 1,000 tons of ore in their bins.

Baldwin and Kirk were very successful in their first arrastra clean up, the ore netting them over $20 per ton.

King & Co., who are working about two miles above Blewett on the Peshastin, are reported to have struck a rich body of gold ore.

WYOMING.

BIG LARAMIE PLACERS. — The Cheyenne *Tribune* publishes the following in relation to the Big Laramie placers: A private letter was received in this city hy a heavy mining promoter from a prospector at Dodge City on the Laramie river, in Albany county. The letter states that after a close assay of the placer mines helonging to the Cheyenne & Iron Mountain Company, on that stream, the ground has been fouud to run from 75 cents to $1.50 per yard. Each pau has shown from 200 to 225 colors of gold.

MEXICO.

CHIHUAHUA.

THE CORRALITOS MINE.—At the Corralitos mine in the State of Chihuahua, Mexico, about 500 men are at work. The payroll averages over $36,000 monthly.

Patentable and Unpatentable Inventions.

In an opinion read by Judge Brown in the Supreme Court of the United States, on the 22d ult., the distinction betweeu patentable and unpatentable inventions was declared. The case in hand came from the Circuit Court for the Northern District of this State, i uvolving three patents for the manufacture of belt pulleys and for the product of that process, which Philip Medart et al. alleged had been infringed by the Risdon Iron and Locomotive Works. The court below gave judgment in favor of the claimants. The Supreme Court reversed this decision. Discussing the claims of the patent for the manufacture of the pulleys, Justice Brown said: That certain processes of manufacture are patentable is as clear as that certain others are not, but nowhere is the distinction between them accurately defined. There is somewhat of the same obscurity in the line of demarcation as in that between mechanical skill and inveution, or in that between a new article of manufacture which is universally held to be patentable, and the function of a machine which it is equally clear is not.

It may be said, in general, that processes of manufacture which involve chemical or other similar elemental action are patentable, though mechanism may be necessary in the application or carrying out of such processes, while those which consist solely in the operation of a machine are not. Most processes which have been held to be patentable require the aid of mechanism in their practical application; but where such mechanism is subsidiary to the chemical action, the fact that the patentee may be entitled to a patent upon his mechanism does not impair his right to a patent for the process, since he would lose the benefit of his real discovery, which might be applied in a dozen different ways, if he were not entitled to such patent. But, if the operation of his device be purely mechaaical, no such considerations apply, since the function of the machine is entirely independent of any chemical or other similar action. * * * * It is equally clear, however, that a valid patent cannot be obtained for a process which involves nothing more than the operation of a piece of mechanism, or, in other words, for the function of a machine.

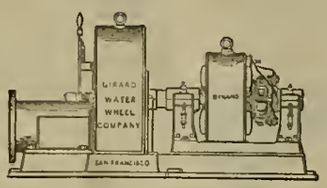
A Salt Laker's Description of California Mines.

Mr. E. S. DeGolyer, who has just returned from a visit to his properties in Calaveras county, California, gives a glowing account of the richness of the mines of that district. Mr. DeGolyer is the owner of the Gottschalk mine, which is situated ten miles north of the mines of the famous Utica Company, and south of the Keystone. When he visited Cripple Creek he thought he had seen the greatest gold possibilities the world ever had or ever would produce, but since he became interested in these California properties he considers that all former gold belts are outdone. This gold belt is on the original mother lode of the Sierras, lying low in the foothills and parallel to the range. The extent of the deposits and the richness of the ore have not yet been definitely ascertained, nor has even an approximation of the values been reached, but in places the vein of gold-bearing matter is known to be 120 feet thick, and in the case of the Utica, where the greenstone wall was cut through, another veiu seventy feet wide and of the same general character as the original was cut into. This Utica mine is now producing from $350,000 to $450,000 per month, and the Keystoue, at a depth of 2000 feet, is now paying monthly dividends of $120,000. This latter mine is in litigation on a question of end lines, aud four weeks ago extracted one ton of ore for the benefit of the experts in the case that rendered an assay value of $170,000 to the ton.

In connection with the title of the Gottschalk, Mr. DeGolyer's property, there is an excellent water right for power, and during the present summer Mr. DeGolyer will erect a stamp mill. He is not content with one mine, however, and has closed a deal for the purchase of the Donnellan. This is an "open air" mine, the vein lying up against the grass roots, and from the surface down everything has been milled for the past thirteen years. A hole is now down a few feet deep, but covering an area of one-fifth of an acre, and out of this hole, with almost no expense for mining, several fortunes have been taken out. It is the intention of Mr. DeGolyer to sink a shaft in the soft material of the ore vein, and go down for the contact of the original lode.

Speaking of this mother lode, the discovery of which was promised by geologists and practical miners thirty years ago, Mr. DeGolyer yesterday stated that the "wildest dreams of African riches would not begin to compare with the gold bodies on the western slope of the Sierras, where the origiual source of the gold of the Rocky mountains is located, and from which all the riches of the Pacific slope had their birth."—Salt Lake Tribune, April 25th.

American Girard Water Wheel.



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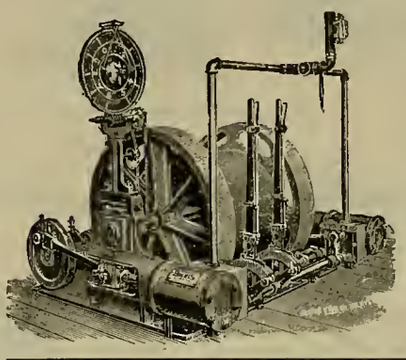

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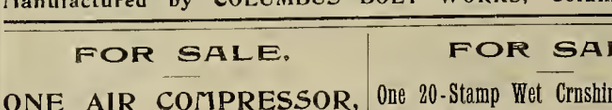

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NUMBER XXVII.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

Alameda.—In March, 1871, a letter from Livermore to the Alameda *Advocate* announced an oil excitement in Livermore valley. A well fifty-five feet deep commenced flowing gas which, igniting by accident, "burned brilliantly; there was a constant roaring going on at the bottom of the well, and the water was blue and smelled of coal oil and sulphur."

In 1890 there was a similar excitement at Pleasanton. "Gas and oil were discovered on the ranch of Joseph Brown, four miles east of the town. An inch pipe was inserted into a closed ten-inch well that had been sunk; the gas was ignited and it burned with a clear, bright flame." In April, 1891, there was another excitement at the same locality, which soon subsided.

During the excitement at Pleasantou several shallow wells were sunk at or near Martinez, and a small quantity of gas obtained at a depth of from fifty to eighty feet.

Amador.—"The gas well discovered in the buttes near Sutter creek many years ago, by prospectors in search of coal, is about to be improved and utilized. There is a flame now issuing from it that leaps six feet from the ground, and is eighteen inches across." [Newspaper excerpt.]

Butte.—A few years ago Mr. E. D. Sewell, of Butte creek, described a well which he sunk to a depth of seventy feet. The water was strongly charged with mineral matter. In sinking, he heard a continuous roaring sound which grew louder as the work progressed. The sound was attributed to rushing gas. This is a personal statement by Mr. Sewell.

Colusa.—This county is remarkable for being the theater of widespread solfatarie activity, of which Sulphur creek seems to be the center. There hot springs, quicksilver mines, sulphur fumaroles and petroleum springs are common. Hydrocarbon, hydrosulphuric and carbonic acid gases issue from the earth at many points. One flaming jet, before mentioned, resembles the fires of Barigazzo in Italy, and the Persian flames on the shores of the Caspian sea. It has not been extinguished since 1859, except at intervals.

This is probably the oldest example of escaping gas known in California. It lies 470 feet above the hotel at Wilber springs. I visited this very interesting locality in March, 1890, and found the gas burning with a lambent blue flame, tinged with pale yellow at the apex; the flame was very hot, and it issued from a small orifice and rose about two feet. The slime through which the burning gas escaped is black or very dark colored, but the inner surface of the opening is pale yellow, the effect of long-continued heat.

I have the statement of a gentleman who lived at Sulphur creek for some time, to the effect that he once extinguished the flame and found cinnabar crystals lining the opening from which the gas escapes. These he scraped away, and again lighted the gas; in two months a second examination showed that the crystals had been replaced.

It is said that if this fire is extinguished it will relight spontaneously; I do not credit this statement, but it might be inflamed by some accidental grass or forest fire.

Gas rises in bubbles not only in the bed of Sulphur creek and basins of the mineral springs, but in any shallow pool formed by rains or overflow of the streams. From this it may be inferred that invisible gases are escaping over the surface elsewhere. This will be readily conceded by those who have experienced the odors of hydrogen sulphide and sulphurous acid gases at this locality.

Contra Costa.—In 1888 a gas spring was discovered at Byron springs, fifty feet above tide water. A pipe was driven down thirty-six feet, through which some gas flowed. A second well was then sunk forty-eight feet and more gas obtained, but the find did not prove to be one of great importance. The second well is said to have passed through six feet of iron pyrites.

In 1888 a gas well was commenced one and a half miles from Lafayette and ten miles north of Oakland.

In 1890 I visited the ranch of Mr. J. G. Miner, who was investigating some superficial emanations of natural gas. At several points a pipe driven into the soft earth became an exit for a little gas which could be lighted if a burning match was quickly applied; and at others, by stirring the muddy waters in the creek bed, gas escaped which could be ignited.

At several places thick maltha issued from the ground, and a highly bituminous shale was seen cropping from the ground, which is well worthy of investigation.

Fresno.—The indications of natural gas in Fresno county are sufficiently encouraging to have induced capitalists to form prospecting companies, but I am not aware that any material success has attended such explorations.

(To be Continued.)

The Dead of the Sea.

An inquisitive Frenchman has thought it worth while to ask what becomes of the bodies, after death, of the numberless fish and other living creatures that fill the sea. Of course they all die, sooner or later, and yet it is an occurrence so rare as to be practically unknown for anybody who lives beside or on the ocean to come across the "remains" of even a single victim of the fate that awaits all things mortal. In the profounder depths putrefaction cannot take place, so if a dead fish once reached those calm, chill abysses he would be preserved until the end of time. Probably, however, no such peaceful repose awaits more than an infinitesimally small proportion of the finny folk, and no great accumulation of lifeless bodies exists at the bottom of the sea. The living eat the dead before they can make the long, slow journey downward. As a matter of fact, extremely few fish, and perhaps none, ever meet what is known as a "natural death." Almost always they are slain and devoured, and so put definitely out of the way.

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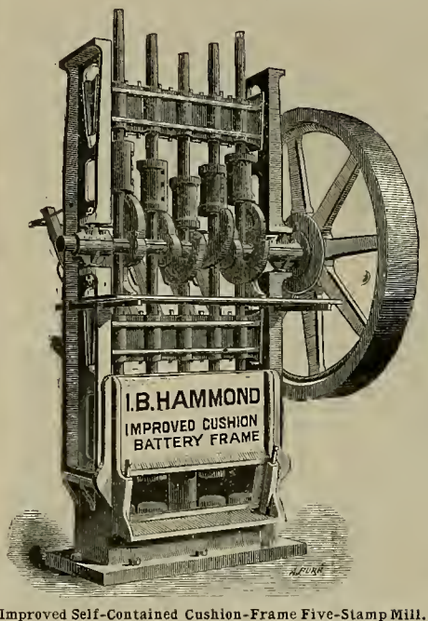

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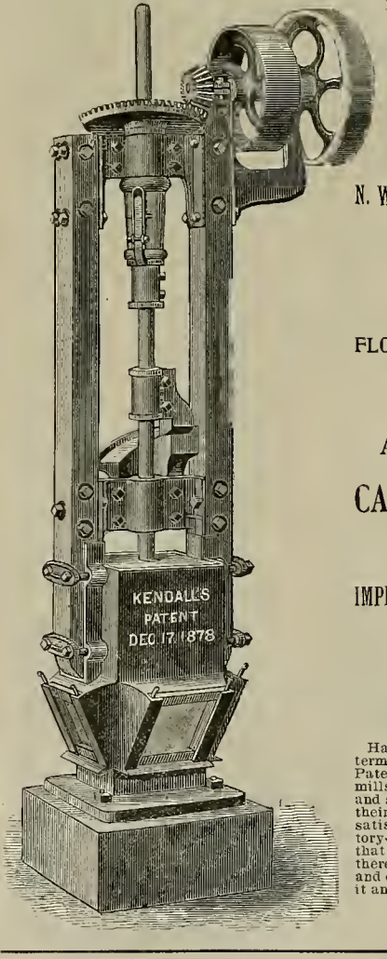

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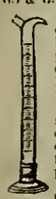
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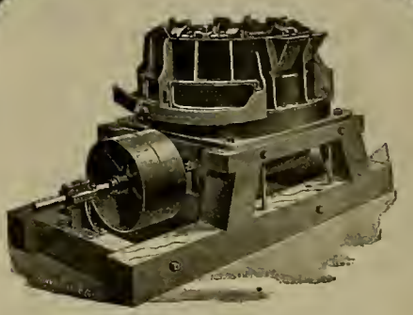

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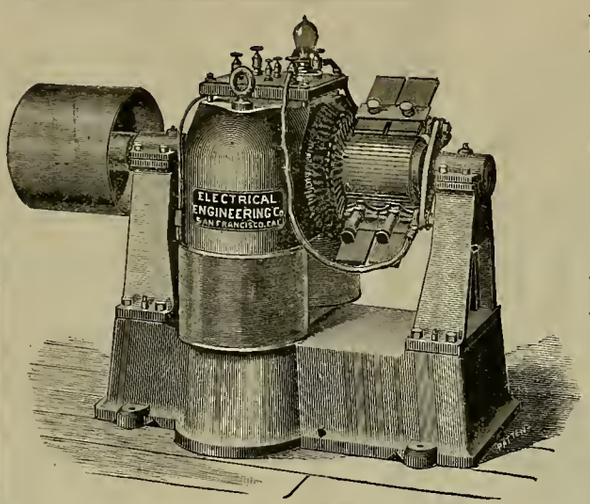

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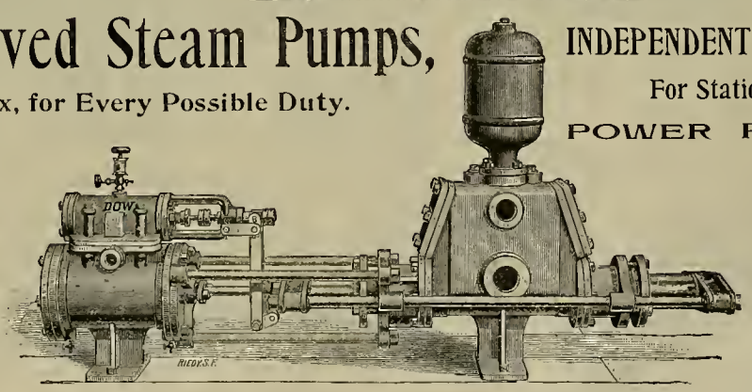

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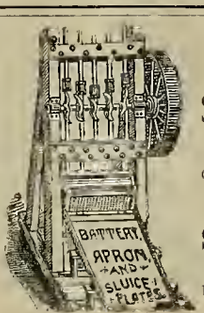

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Market Reports.

The Markets.

SAN FRANCISCO, May 2, 1895.

Silver was steady during the week, closing at about the same figures as the preceding week. The *Mexican Financier* says: Mexico does not want a too decided improvement in silver, as the country has begun to adjust itself to the new condition, and home manufactures and exports of products have been stimulated by the operation of the high rate of exchange. 'Tis different in the United States.

The metal market is unchanged.

The Leather Belting Manufacturers' Association advanced the prices of belting twenty per cent on the 22d ult.

San Francisco Mint Coinage.

The coinage of the San Francisco Mint for April was as follows:

Double Eagles	$1,610,000
Standard Dollars	100,000
Half Dollars	48,000
Dimes	70,000
Total	$1,828,000

The coinage for the first four months of this year was:

Double Eagles	$7,370,000
Eagles	242,500
Standard Dollars	300,000
Half Dollars	100,000
Quarter Dollars	320,000
Dimes	70,000
Total	$8,602,500

New York Metal Market.

NEW YORK, May 2. — PIG IRON—Scotch, 19@20c; American, 9.50@12.00c.

COPPER—Brokers', 9.75c; exchange, 9.65c.

LEAD—Brokers', $3.95; exchange, $3.07½.

TIN—Straits, 14.00@14.10c.

SPELTER—Domestic, $3.20.

New York Silver Prices.

NEW YORK, May 2.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30⅝	67½	9 65	.....
Saturday	30⅝	66½	9 65	3 07½
Monday	30⅜	66⅛	.....	.....
Tuesday	30¼	66⅛	.....	.....
Wednesday	30¼	66⅛	9 65	3 07½
Thursday	30¾	66½	.....	.....

The local hullion, money and exchauge quotations current are as follows:

Commercial Loans, ⅝ per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	5c
New York Telegraphic Transfer	7½c
London Bankers' 60 days	$4.88½
London Merchants	$4.86
London Sight Bankers	$4.89¾
Refined Silver, per ounce	65½c
Mexican Dollars, nominal	54@54½

San Francisco Metal and Coal Market.

ANTIMONY.

Per lh	—	@	10

BORAX.

Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5

COPPER.

Bolt	20	@	—
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	16
Ingot, wholesale	13	@	14

TIN PLATE.

Per bx	5 25	@	6 00

PIG TIN.

Per lb	15	@	16 00

IRON.

American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00

STEEL.

English, lb	14	@	16

LEAD.

Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do. "		"	1 45

QUICKSILVER.

Home trade, per flask	$7 00	@	— —

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00		
Greta	7 75		
Nanaimo	6 50		
Gilman	6 00		
Seattle	6 25		
Coos Bay	6 00		
Cannel	10 50		
Egg, hard	13 00		
Wallsend	7 50		
Scotch Splint	7 75		
Brymbo	7 75		
West Hartley	8 75		

TO ARRIVE—PER TON.

Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	16 00	@	— —
Cumberland	11 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'	75c ₱ bbl		
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

LUMBER.

SAN FRANCISCO — WHOLESALE.

Redwood, Flumiug	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

NAILS.

Wire	$1 75		
Cut	1 55		

ZINC.

Sheet	8¼@		

THE official population of the city of New York was stated to be 1,984,866 on the 1st inst.

Mining Share Market.

SAN FRANCISCO, May 2, 1895.

Stocks sold up during the week, and, compared with April, this mouth opens with general activity. The foreshadowed Hale & Norcross decision and the improved appearance of the mine get the eredit for the advance in that stock to $1.55. That stock shared with Con. Cal. and Ophir the honor of being scarce and in demand.

John W. Mackay writes from New York that he will be here this month.

The following paid dividends in April:

Alaska-Treadwell M. Co., 37½c ₱ share	$75,000
Alaska-Mexican M. Co., 15c ₱ share	30,000
Homestake Mining Co., 25c ₱ share	31,250
Napa Con. Quicksilver M. Co., 20c ₱ share	20,000
Total	$156,250

The next assessment due is on Ophir next Tuesday, May 5th. The annual meetings of the Scorpion and East Sierra Nevada have been called for the 13th. The annual meeting of the North Star and Original Empire Mining Companies have been called for next Wednesday.

The following illustrates the changes of the week:

MINES.	25	2
Alpha	$	09
Alta Consolidated	$ 17	.....
Andes	..	20
Belcher	65	64
Best & Belcher	78	74
Bodie	1 20	1 10
Bullion	..	..
Challenge	.....	.....
Chollar	45	44
Confidence	1 50	1 25
Consolidated California and Virginia	3 00	3 00
Consolidated New York	..	.....
Crown Point	62	59
Exchequer	.....	.....
Gould & Curry	45	45
Hale & Norcross	1 30	1 50
Justice	10	..
Mexican	81	77
Ophir	1 65	1 45
Overman	69	..
Potosi	46	..
Savage	30	28
Sierra Nevada	81	77
Union	51	47
Utah	..	.....
Yellow Jacket	37	33

San Francisco Stock Board Sales.

SAN FRANCISCO, May 2, 1895.

9:30 A. M. SESSION.

200 Alpha	09	300 Mexican	75
100 Bulwer	13	100	76
150 Con Cal & Va	3 00	950 Occidental	44
200	2 95	50 Ophir	1 45
200 Crown Point	57	300 Yellow Jacket	33
300 Gould & Curry	44		

SECOND SESSION—2:30 P. M.

300 Andes	20	500 Hale & Norcross	1 15
100 Belcher	64	400	1 50
100 Best & Belcher	74	200 Julia	05
100 Bodie	1 10	200 Mexican	77
100 Caledonia	07	500 Occidental	40
500 Chollar	44	100 Savage	28
50 Confidence	1 25	200 Seg Belcher	18
400 C. C. V	2 95	100 Sierra Nevada	77
100 Crown Point	59	300 Union	47
100 G. & C	45		

BOILERS may deteriorate from nonuse more than from continuous service with proper attendance. Such an instance is related by John A. Fish in *Power*. In his case, the boilers to be laid off were kept full of water to prevent internal corrosion, with the result that the large body of cold water caused condensation on the fire or air side of the tubes, and the resulting moisture mixing with the deposits upon the iron produced rapid corrosiou. This action has inclined engineers to completely empty their boilers, rather than to leave them full, taking off the plates so as to secure a free circulation of air and keep the sheets clean and dry. The boiler is thus always open for inspection, and any tendency to corrosion can be quickly detected.

The following are the nine longest words in the English langnage at the present writing:

Snbconstitutioualist.
Incomprehensibility.
Philoprogenitiveness.
Honorificibilitudinity.
Authropophagenarian.
Disproportionableness.
Velocipedestrianistical.
Transsubstantiationableness.
Proantitransubstantiationist.

Swiss firms have entered into a contract with the Japanese war office to supply a sufficient number of watches for one to be given to every soldier who has served in the campaign when the Mikado reviews his victorious troops at the close of the war. The watches, which will take the place of war medals, are to cost $1.50 apiece.

THE productiou of mica for '94 in the province of Quebec aggregated 400 tons. About 150 men were employed in mining it.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied.*	*Delinq't and Sale.*	*Secretary.*
Andes S M Co, Nev	41	15c	May 1,	Jun 1, Jun 17	J W Twiggs, 309 Montgomery
Brunswick Con G M Co, Cal	8	2c	Mar 20,	Apr 20, May 15	J Stadtfeld Jr, 309 Montgomery
Crown Point G & S M Co, Nev	65	25c	Mar 12.	Apr 16, May 7	Jas. Newlands, Mills Building
H P Taylor M Co, Cal	.....	4c	Apr 19,	May 31, Jul 26	J Henry Smith, 431 California
Occidental Con M Co, Nev	18	10c	Mar 20,	Apr 23, May 15	A K Durbrow, 309 Montgomery
Ophir S M Co, Nevada	65	25c	April 4,	May 7, May 27	E B Holmes, 50 Nevada Block
Overman, Nev	73	10c	Apr 15,	May 21, Jun 11	Geo D Edwards, 414 California
Savage M Co, Nevada	86	20c	Apr 19,	May 22, Jun 11	E B Holmes, 309 Montgomery
Yellow Jacket, Nev	59	25c	Apr 15,	May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETING.

Company and Location.	*Secretary and Office in S. F.*	*Date.*
Gold Ridge Con M & M Co	R H Daley, 216 Post	May 20

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING APRIL 23, 1895.

538,219.—FRUIT PACKAGE—H. Baskervillo, St. Helena, Cal.

537,912.—LEATHER BLANKS—J. K. Bigelow, S. F.

537,913.—LOOP MACHINE—J. K. Bigelow, S. F.

538,150.—DAMPER REGULATOR—A. P. Buruham, S. F.

537,969.—BUTTON—Thos. Fahey, Spokane, Wasb.

538,076.—CAR COUPLING—C. W. Hintou, Los Angeles, Cal.

537,894.—WATER TANK—F. W. Krogh, S. F.

538,000.—BOILER—J. C. H. Stut, S. F.

538,050.—PUMP—W. Swabel, S. F.

538,056.—FOOD WARMER—D. R. Wilder, Los Angeles, Cal.

538,140.—REIN HOLDER—J. P. Wilson, Red Bluff, Cal.

538,006.—GAS BURNER—R. Wynell, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CENTRIFUGAL PUMP.—Wm. Swabel, San Francisco, Cal. Assignor of one-half to Isaac L. Burton of same place. No. 538,050. Dated April 23, 1895. This invention relates to centrifugal pumps. It consists of a case having an inlet opeuing at the center of one side, to which an iulet pipe is holted, a shaft passing through the opposite side of the case with a two-part runner or disk fixed thereon so as to rotate within the case. Each part of said runner has a spiral channel formed upon it so that the two form a tubular spiral, tapering from the inner end outwardly. Fixed radial partitions extend from the center of the runner to the augles where the spiral passages meet so as to complete the division between said passages. The case has a spiral discharge passage formed hetween its iuner wall and the periphery of the runner. The periphery of said runner operating close to the inner wall of the case at the point where the smallest end of the spiral discharge makes a junction with the largest end of the passage, so that the water received into the spiral channels of the runuer, discharges into the smallest end of the spiral discharge until the narrowest part reaches the point where the two merge into each other.

GAS REGULATING BURNER.—Robert Wynell, San Francisco, Cal. No. 538,006. Dated April 23, 1895. The object of this iuvention is to provide a deviee which is applicable to each individual gas hurner, and which serves to automatically regulate the supply of gas without reference to the variations in pressure which may take place, the deviee heing also applicable in any pipe or passage through which fluid or liquid flows under a variable pressure. It consists of a plug fitting closely in the passage in the interior of the pipe having spirally formed grooves or channels extending in opposite directions from one end of the plug to the other, said channels intersecting each other at two distinct points upon opposite sides of the plug wherehy the fluid is inspected and broken at each intersection and upon opposite sides.

BOILER.—John C. H. Stut, Oakland, Cal. Assignor to the Locomotive Feed Water Heater Co. of Bakersfield, Cal. No. 538,000. Dated April 23, 1895. This invention relates to that class of boilers in which a supplemental heater located within the fire-hox is connected at its lower portion by a pipe with the lower portion of the hoiler, and at its upper portion is connected with and is adapted to conduct the hot water or steam into the upper portion of the hoiler, whereby a complete circulation is maintained. The invention consists in an improvement in the form and construction of the supplemental heater (it heing jointless and tuheless, made of a single piece of metal and of circular cross section), whereby it can withstand the heat to better effect, is not likely to leak, and will not disturh joints hy its expaasion and contraction. It also consists in the novel construction, wherehy the circulation of the water may he observed, and also in a novel filtering and blowing off device in the pipe which connects the lower portion of the hoiler with the supplemental heater, the object heing to effect a perfect filtering of the water and deposit of the sediment and to control its blowing off readily.

THE sky is whiter over the cultivated than over the uncultivated portions of the earth's surface, because a great deal of coarse dust is present in the atmosphere in the former instance, with the result that a larger proportion of white light is diffused.

Assessment Notices.

OVERMAN SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of April, 1895, an assessment, No. 73, of ten cents (10c.) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of May, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 11th day of June, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. D. EDWARDS, Secretary.

Office—No. 414 California street, San Francisco, California.

H. P. TAYLOR MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Liberty Mining District, Siskiyou county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the nineteenth day of April, 1895, an assessment of Four (4c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, 39 Merchants' Exchange, 431 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the thirty-first day of May, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on FRIDAY, the twenty-sixth day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HENRY SMITH, Secretary.

Office: 39 Merchants' Exchange, 431 California St., San Francisco.

ANNUAL MEETING.

The Regular Annual Meeting of the Stockholders of the Gold Ridge Consolidated Mining and Milling Company will be held at the office of the Company, No. 216 Post street, San Francisco, California, on Monday, the 20th day of May, 1895, at the hour at 3 P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such business as may come before the meeting.

Transfer books will close on Friday, May 17, at 1 o'clock P. M.

RICHARD PHELAN, President.
R. H. DALEY, Secretary.

Office, 216 Post St., San Francisco, Cal.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medica College, of New York City.

UNION IRON WORKS,
SACRAMENTO.....CALIFORNIA.

ROOT, NEILSON & CO.,
—MANUFACTURERS OF—
STEAM ENGINES, BOILERS,
And all kinds of
MACHINERY FOR MINING PURPOSES.

Flour Mills, Saw Mills and Quartz Mills; Machinery Constructed, Fitted Up and Repaired.
FRONT STREET, Bet. N & O.,
SACRAMENTO, CAL.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from T. G. Phelps, in the Liberty Hill mine, Nevada Co., and John Spaulding, in the Polar Star mine, near Dutch Flat, Placer Co., to impound tailings behind the Liberty Hill dam, in Bear River; and from Ah Wing, in the St. Lawrence mine, near Moores Flat, Nevada Co., to impound tailings behind a brush dam in Illinois canyon, gives notice that a meeting will be held at Room 92, Flood Building, San Francisco, Cal., on May 13, 1895, at 1:30 P. M.

MECHANICAL DRAWING

Mechanics; Mechanical Drawing; Architecture; Architectural Drawing and Designing; Masonry; Carpentry and Joinery; Ornamental and Structural Iron Work; Steam Engineering (Stationary, Locomotive or Marine); Railway Engineering; Bridge Engineering; Municipal Engineering; Plumbing and Heating; Coal and Metal Mining; Prospecting, and the English Branches. Students make rapid progress in learning to Draw and Letter. Send for Free Circular, stating the subject you wish to study, to

THE INTERNATIONAL CORRESPONDENCE SCHOOLS, Scranton, Pa.

TAUGHT BY MAIL THOROUGH PRACTICAL

THE JONES ROCK DRILL

IS THE

Only Successful Hand Power Drilling Machine Ever Invented.

It is strong, durable, reliable, simple, compact, light, easily handled and operated by one man, and will reduce the cost of rock drilling at least Fifty per cent.

Our handsomely illustrated pocket catalogue fully explains the features and workings of the drill. It should be in the hands of every mine owner, leaser, contractor and prospector in the West. *Sent free on application.*

If you are interested in Rock Drilling Correspond with us.

WE CAN SAVE YOU MONEY.

FRANK T. SUTHERLAND, M'g'r Pacific Coast Agency.

OFFICE AND WAREROOMS:

Care PARKE & LACY CO. ..... 21 and 23 Fremont Street, San Francisco, Cal.

Or, Address the Company at Its Denver Office.

Rand Drill Co.

Rock Drilling, Air Compressing, Mining and Quarrying

Machinery.

23 Park Place, - - - - New York, U. S. A.

BRANCH OFFICES:

Monadnock Building ..... Chicago
Ishpeming ..... Michigan
1316 Eighteenth Street ..... Denver
Sherbrook P. O. ..... Canada
Apartado 830 ..... City of Mexico

H. D. MORRIS & CO., Agents, 141 First St., San Francisco, Cal.

WATER

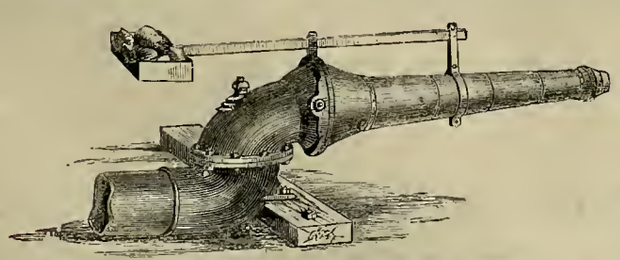
WHEEL

CASCADE WATER WHEEL

Adapted to all heads, from **30 FEET TO 2000 FEET.** Our experience of **33 YEARS** in the water wheel business enables us to suit every requirement of water power plants. Send for illustrated pamphlet. This new wheel has given an unequaled Economy in Water.

JAMES LEFFEL & CO. Springfield, Ohio, U.S.A.

IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

P. & B. PAINT.

Absolutely Acid and Alkali Proof.

For CHLORINATION WORKS and Preserving Wood and Iron from Acid Attack, Rust or Decay.

P. & B. ROOFING.

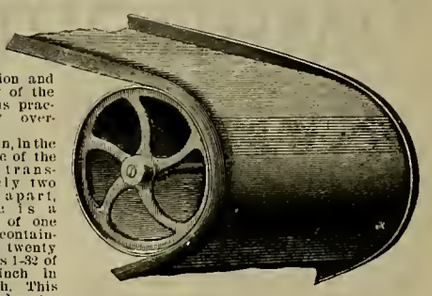
Send for Circulars.

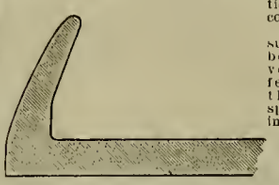
PARAFFINE PAINT CO., 116 Battery Street, S. F.

221 South Broadway, Los Angeles, Cal. 49 First St., Portland, Or.

Blasdel Improved Concentrating Belt.

We keep in stock belts suitable for the Frue, Triumph, Johnston and Tulloch machines, and make all lengths and widths to order.





Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.

Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

H. G. BLASDEL, JR., Manager,

419 California Street, Haywards Building ..... San Francisco.

GATES ROCK AND ORE BREAKER

OVER 3000 IN USE THROUGHOUT THE WORLD

PRODUCES A MORE PERFECT CUBIFORM MATERIAL AND A GREATER QUANTITY IN A GIVEN TIME PER HORSE POWER USED THAN ANY OTHER CRUSHER ON EARTH.

CAPACITIES UP TO 150 TONS PER HOUR. NINE DIFFERENT SIZES.

WE HAVE BUILT THE LARGEST STONE CRUSHING PLANTS IN EXISTENCE

GENERAL MINING MACHINERY

OF EVERY DESCRIPTION.

TREMAIN STEAM STAMPS

Connorsville Blowers, King-Darragh Concentrators, Stamps, Hoists, Rolls, Pans, Settlers, Smelters, Metallurgical Appliances, Etc.

COMPLETE INSTALLATIONS.

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PATENT SOLICITORS.

ESTABLISHED 1863

Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us enables us to give advice which will save inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 220 Market St., S.F.

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Office and Works: Cor. Beale and Howard Sts., San Francisco.

Cable Address: "RISDON'S" San Francisco.

MANUFACTURERS OF

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MINING, MILLING, PUMPING and HOISTING PLANTS.

IMPROVED CRAWFORD MILL.

The Cheapest and Best Mill for extracting gold from comparatively free milling ores. Requires one-third the water, and three-fourths the power of stamps. Costs less, is operated cheaper, and will save 20 to 40 per cent more gold. Average saving 85 per cent. Inexpensive foundation. No plates or screens. Wear and tear guaranteed not to exceed thirty cents per ton. Capacity ten tons. Full particulars,

MECHANICAL GOLD EXTRACTOR COMPANY,

47 BROADWAY, NEW YORK.

HUNTINGTON CENTRIFUGAL ROLLER Quartz Mill.

TUSTIN'S PULVERIZER, WORKS ORE Wet or Dry

FULTON Engineering AND Ship-Building Works.

MINING AND MILLING MACHINERY.

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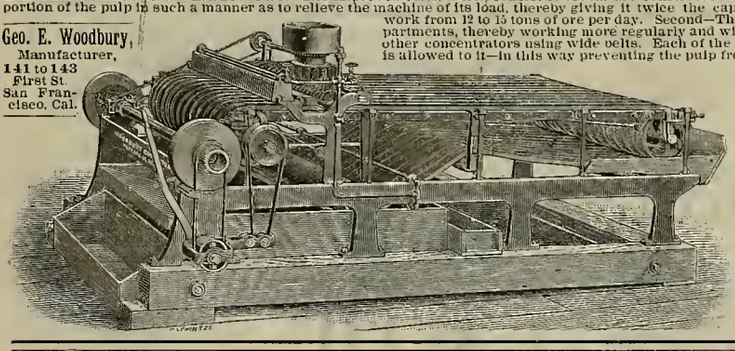
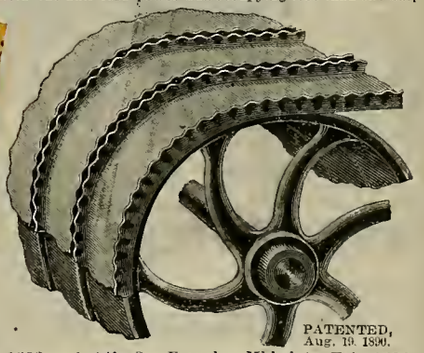
MAIN WORKS: Harbor View, San Francisco.

THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891, MORE THAN DOUBLE THIS CAPACITY with one-half less power and occupying less than one half the space of any other concentrator. Built of best Steel and Wrought Iron. Strong and durable. **Price $575 f. o. b.** Send for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to rece portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enablin work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several partments, thereby working more regularly and with much less attention than is necessary other concentrators using wide belts. Each of the belts on this machine takes care of the pu is allowed to it—in this way preventing the pulp from running to the lower side of it, as is when a machine becomes out of level wide belts are used. Third—The belts perfect line, needing no adjustment to their running from side to side, as in ot centrators. Fourth—The belt surface proved by indentations and corr causing the Concentrator to save phurets and quicksilver, and perf work. Fifth—The belts have fluted rugated edges, to form an expanded which effectually prevents front ding. Sixth—The feed arrangement fect. Seventh—The machine is constructe iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

Geo. E. Woodbury, Manufacturer, 141 to 143 First St. San Francisco, Cal.





PATENTED, Aug. 19, 1890.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1894.

Cal State Library

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—MANUFACTURERS OF—

MINING AND MILLING MACHINERY,

Automatic Cut-Off Engines, High-Speed Engines, Hoisting Engines, Quartz Mills, Manty Chili Mills, Rolls and Concentrating Machinery, Dodd Sigmoidal Water Wheel, PUMPS--Cornish and Other, Copper and Lead Furnaces, All Classes of Marine Work.

SHIP BUILDERS. ★ BUILDERS OF U. S. WAR SHIPS. ★ HYDRAULIC LIFT DOCK.

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Travertine.

The mineral wealth of California comprises much besides its metals. Valuable alike for use or ornament are many other minerals. Among the rarest, yet most valuable, of these non-metallic substances is California travertine. It is a white, crystallized limestone, found in few parts of the State in quantity sufficiently large to be of commercial value. A deposit near Tolenas springs, Solano county, attracted some attention several years ago, but its irregularity of fracture made it impossible to satisfactorily dress or quarry it, and it was devoted to the humbler use of making a superior quality of lime, till fuel becoming scarce the work lapsed.

Recently a deposit has been discovered about a mile southeast of Bridgeport, Mono Co., which is the subject of the two accompanying illustrations. It is described in the last State Mineralogist's report as near the base of an extensive area of hilly country formed of hornblende andesite. Here four claims have been located in one block, but the most of the travertine is confined to two of them. The springs, which at one time were more numerous than at present, have built up a deposit of unknown depth, in what is apparently a basin-like depression; a large part of this mass consists of porous limestone, but in the center and eastern part deposits of a different kind have been formed. Here are eight distinct moles or ridges, seven of them nearly parallel and built up from ten to twenty-five feet above the general level. Running longitudinally through each of these, and generally nearly vertical, is a fissure, sometimes open and nearly two feet wide, and at others closed by a deposit of banded onyx (aragonite) or travertine. The outer portion of these ridges is formed generally of a somewhat shelly and porous lime deposit. The open cavities sometimes have a depth of fifteen feet, and in them can be seen to advantage the character of the travertine. It would appear that the springs which carried the lime, magnesia, iron, etc., which were deposited to form the ridges, were generally arranged along parallel fissures in the underlying rock. In places it would seem that as the ridges were built up the central fissure grew wider, and the deposition terminated with the filling of this central cavity by travertine. In nearly all cases the travertine was formed in the vertical fissure, while the shelly layers of the lime adjoining were nearly level, sloping off on either side. One mole is still in process of formation. Numerous springs, varying in temperature from lukewarm to boiling, are scattered irregularly over the spaces between the ridges, but do not leave any deposits near their orifices, the lime and magnesia in the latter case not being precipitated immediately on reaching the surface. The outer portions of a number of the moles have been partly worn away. In one or two there are considerable quantities of magnesia and soda; the travertine in the center, being much harder, is not so easily eroded. The extent of the travertine and onyx is evidently considerable, insufficient work has yet been done to show the depth to which they reach. In places it would appear that it must be more than fifty feet. The great beauty of the travertine found here will undoubtedly bring a large amount of it into use. The California Travertine and Onyx Company, of Bridgeport, is developing the property.

RECENT TRAVERTINE DEPOSIT, MONO COUNTY.

MAIN FISSURE OF THE TRAVERTINE DEPOSIT.

A TWENTY-TWO-TON Armstrong rifle throws a solid shot twelve miles, much farther than its report can be heard. At its highest point, for this extreme range, the shot would be over three miles above the earth's surface.

English Comment.

The London *Mining Journal*, in its issue of April 20th, has a fair article on "Gold-Mining Progress in California," its leading editorial. It is conservative in tone. In the course of the article it says: "Considerable attention is being concentrated upon the mineral wealth of California, and renewed activity is the consequence. * * * * No item contributing of late to the prosperity of the mining industry is more significant and conspicuous than the evidence continually forthcoming, both verbal and written, respecting the remarkable gold richness of California. Experts—well-known and reliable engineers—who have recently visited the country, speak in glowing terms of its wealth; of the facilities that exist for working, and of the brilliant future that is in store for it, provided that the opportunity now presented is taken advantage of. Of the latter alone they are doubtful, for effort and capital are being concentrated too much in one direction, to the disadvantage of other fields that are worthy of their attention. The interest in gold mining in California has markedly increased during the past two years, very likely due to the unexampled depression which has characterized silver mining. It is interesting, as well as significant, to note that the three properties now producing the largest amount of gold per annum are all mines which were abandoned some years ago, when the conditions were different; but, being thoroughly equipped and exploited by the reinvestment of capital, were reopened and successfully worked. As is well known, the gold is the product largely of quartz mines, and within recent years the cost in both mining and milling has been greatly reduced. The consequence is that gold mines which could not formerly be profitably operated are now worked at a profit. Speaking of quartz mining, evidence proves demonstrably that it is in a better condition than it ever has been. The speculative features have been to a great extent eliminated and careful business methods adopted, resulting in a more profitable work and greater confidence of investors. The annual gold production of California has remained for some years between twelve and thirteen millions of dollars; but, of late, in consequence of the renewed activity of which we have spoken, the output has been materially enlarged. Many old properties have been reopened and new ones developed. * * * * California seems to possess all essentials for the profitable prosecution of the mining industry, except capital. Through lack of the latter many promising claims are lying idle. Nevertheless, there is a faint hope that even this vital necessity will be rectified, but, unfortunately, it cannot be prophesied that it will be remedied in the near future."

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J. F. HALLORAN.....General Manager

San Francisco, May 11, 1895.

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AMADOR COUNTY is interested in the preseut project of working the 20,000 tons of tailings at the Drytown Sulphuret Works by a "modification of the cyauide process." The tailings are credited with an average value of $8 per ton. The works, which have a daily capacity of 75 tons, were expected to start this week, and the result may be of interest to owners of similar dumps in other places.

THE *Examiner* of this city gives just prominence to a recent statement in "Printers' Ink," the great journal for advertisers, published in New York City. "Printers' Ink" is to the advertising professiou in this country what the MINING AND SCIENTIFIC PRESS is to the field it occupies. During the past week this paper is iu receipt of three letters from the proprietors of "Printers' Ink." In one tbe statemeut is made that this paper is credited with a higher circulation rating than any other devoted to mining in the State; in another it is stated that this paper is similarly honored in the realm of science, aud in the third it is averred that the same superior staudard is accorded it in the list of journals devoted to electricity. Each of these three letters was unsolicited. The distinction thus conferred is gratifying to know, but the resultant gratification would be enhanced by the receipt of a further statement from the publishers of that reliable authority that the MINING AND SCIENTIFIC PRESS does not measure its bouudary nor the area of the fields it fills by ordinary State lines, but that, with one exceptiou, it claims in its chosen sphere a larger circulation thau any of its contemporaries or competitors. This is not said boastfully nor with any other than the most kindly and courteous feeling toward its able coutemporaries and energetic competitors, but is simply a statement of the truth. Few, iudeed, are the mining men on this contiuent, wherever they may be, who do not weekly see this paper.

Unfairly Stated.

"I am for restoring silver," says Gen. P. W. Hardin, "to where our fathers had it—free and unlimited coinage." If we restored silver to where our fathers had it, we should expel it from the country. Up to "the crime of 1873," as Gen. Hardin terms it, only about $8,000,000 of silver had been coined in this country, aud for nearly forty years these were so scarce that they were rarely seen except as "pocket pieces" and curiosities.—*Louisville Courier-Journal.*

The *Courier-Journal* is again unfortunate in its statements. The "$8,000,000 of silver" it refers to above were eight million silver dollars. In addition, there were coined $97,000,000 in smaller silver coins, a total of $105,000,000 silver coinage in the period stated. Probably the *Courier-Journal* does not misstate inteutionally, but a California journal which attempted to deliberately aud continually argue and reply iu such a mauner would be told that it was lying.

Progress of the Work.

Mr. A. H. Ricketts, who was recently sent to Washington, D. C., by the executive committee of the California Miners' Associatiou to represent the case of the miners of this State, has returned. One of the first things he noticed at the seat of the National Government was that few, if auy, of the officials knew anything about mining, or had any practical knowledge of the merits of the case, either way. They found it difficult to understand that one-half of a section of land could be mineral and the remainder something else. Drift, hydraulic or quartz miniug were to them unknown terms. It became his province and his purpose to afford some primary information on this subject, and he believes that in this as in other regards the result of his mission will be beneficial. The second uoticeable feature was the evidently superior privileges that the agents of the railroad have there. Continuous residence, long acquaintance and familiarity with the officials have, of course, much to do with that. Mr. Ricketts found upon investigation in Secretary Hoke Smith's office that there was considerable celerity in the approval of supplementary lists. Indeed, it seemed as if the wheels of departmental action had been greased. The Secretary had assured Congressman Caminetti that pending investigation he would suspend further issuance of patents to mineral land grants to the railroads, but examination of the records showed that on April 20th he had formally approved the supplemeutal list of 93,000 acres at the Roseburg office of the S. P. Co., aud on the following day had approved a Central Pacific list embracing three times as much. Four other clear lists had been also approved, all in a space of four weeks, though ordinarily it takes several months to get even one list approved. This seemed to be an extraordinary case. It is possible that the Secretary of the Interior has, in those cases, been imposed upon by some of his subordinates. Mr. Ricketts wasted little time upon H. Lamoreux, General Commissioner of the Land Office, who seems to be merely a willing tool of the railroad company's resident attorneys and satellites, but, after a brief and breezy interview with the Commissioner, he sought the presence of the Secretary of the Interior, and entered a formal protest against such issuance of patents of disputed land to the railroad company. Mr. Hoke Smith had no explanation to offer as to why he broke his promise to Congressman Camiuetti, nor was any explanation asked.

The uext day Mr. Ricketts called upon President Cleveland. To his excellency he recited the main facts, reviewing all that had transpired since the first publication in the MINING AND SCIENTIFIC PRESS of the rules promulgated on the 9th of July '94, and brought up all with which our readers are so familiar, including the swift and stealthy actiou of the company, the unwarranted basis of its claims, tbe apparent collusion iu the Government offices, and laid special stress upon the legal point that in in March, 1879, in a law passed by Congress, it was specifically stated that the Director of the Geological Survey should classify the public lands and examine their geological structure and mineral resources, and that a fair interpretatiou of such law would cause that Government bureau to do all that is designed by the Idaho-Montana act which passed last December, or is contemplated by the California act which did not pass in the closing hours of the 53rd Congress. He argued that the carrying out of that law, with the famous decision of the Supreme Court of the United States last August in the Barden case in Montana, would render furtber legislation on the matter unnecessary so far as California was concerned, and so work as to give justice to the miners or a chance to them to secure justice under its workings. He asked the President to interpose his power in their behalf by ordering the immediate suspension of all proceediugs iu the office of the Secretary of the Interior toward allowing the railroad companies to absorb the public domaiu till Congress met or till some competent tribunal passed upon the points raised and the matters at issue.

The President gave him his undivided attention, seemed surprised at much that he was told, and promised to look into it and help, at the same time asking Mr. Ricketts to remain in Washington to speak further on any point that needed explanation. Three days after—last Saturday—he got the following letter:

A. H. Ricketts—DEAR SIR: I have had an interview with the Secretary of the Interior, and your statement has been referred to him. Of course I do not know what action we can or ought to take on the premises. I merely write to say that there seems to be no necessity of your remaining here to make further presentation of the matter. I do not know how far the patenting process has progressed. It may be that it has reached such a stage as to preclude interruptiou, irrespective of other considerations involved. Yours truly,

GROVER CLEVELAND.

This epistle is no more satisfactory than other famous epistles from its author on equally famous subjects. In it he evinces an intention to leave the matter entirely to the Secretary of the Interior. Whatever further injustice is permitted by the Administration caunot be because of lack of knowledge of the facts. Every official from the President down to the doorkeeper fully understands the situation. Meanwhile tbe work will go on, and persistent effort maintained to secure justice for the California miner and prevent the absorption by the railroad corporations of the mineral area of the commonwealth.

Lateral Rights.

In the United States District Court of Colorado, in the Del Monte case, Judge Hallett, in his decision, gives a definition of the lateral right pertaining to an apex crossing a side and end line, incidentally touching upon the inapplicability of the Amy-Silversmith case to this state of facts. He says:

"It is true that in the Flagstaff case, and recently in the Amy-Silversmith case, the Supreme Court declared that the end lines of a location shall be end lines wheuever the lode ou its strike crosses such lines; but these decisions do not affirm that all end liues of a location crossed by a lode on its strike shall be end lines. The most that can be deduced from them is that opposite lines parallel to each other when crossed by the lode shall be eud lines. The case presented is not within the principle of these decisions. We have a lode extendiug on its strike on the general course of the location and within tne side lines a distance of 1070 feet. It is couceded that the south end line of the location is well placed, aud all parts of the lode covered by the location are within the end lines as fixed by the locator. The difficulty arises from the circumstance that the location extends in a northerly direction about 820 feet beyond the point where the lode diverges from the side line. No reason is perceived for saying that this mistake in the length of the location should defeat the right to follow the dip of the vein outside of the locatiou. It is said that we cannot make a new end line at the point of divergence or elsewhere, because the court cannot make a new location nor in any way change that made by the parties. This, however, is not necessary. We can keep within the end lines fixed by the locator in respect to any extra-lateral right that may be recognized without drawing any line, and if there be magic in the word 'line' it will be better not to use it.

"The case is not entirely different when the lode intersects oue end line and not the other, but keeps within the location for a considerable distance. In that case, as in the accepted case of a lode traversing the location from end to end, the locator ought to be allowed to follow his lode into adjoining territory so far as he may within his lines, and so far as he holds the outcrop in his location. Upon this construction of the statute respondent is entitled to so much of the lode upon its dip as lies between the 'south compromise line' and the point of divergence of the apex of the vein from the location."

It Is Hoped Not.

The gold-mining craze is certain to invade New York in the course of sixty or ninety days. Millions of dollars will be made out of such speculations, and the furor among all classes will be the greatest ever known.—*New York Town Topics.*

It is to be sincerely hoped that such a "craze" will not ensue. Nothing is further from legitimate mining, but nothing so hurts a mining area included in its operations. There are millions to be made by careful investments in gold mines and judicious, economical management of their workings, but only by the slow, ordinary commercial routine attending any other legitimate business. Any one who goes into it on a different proposition is a gambler, and a gambler's fate awaits him.

Concentrates.

Fifty men are now at work in the Willow Creek, Idaho, mining camp.

The April clean-up of the Bonanza, Baker Co., Oregon, ten-stamp mill was $20,000.

The May dividend of the Morning Star mine of Iowa Hill, Placer county, is $4 per share.

The Silver Queen mine, sixty miles south of Kingman, Arizona, is to be sold this month to eastern men.

The Everett, Wash., smelter has resumed operations. There is an accumulation of ore ready for treatment.

It is reported that H. P. Stow of Forbestown, has prohibited the men who work in the Gold Bank mine from gambling.

The April pay-roll of the Comstock mining and milling companies amounted to $76,603.66—about $1000 higher than that of March.

It is reported from DeLamar, Nev., that the mill has been shut down because of a scarcity of water, and sixty men laid off.

"Quartz Johnson," a well known old-timer, who came to Coulterville in '46, died there last Saturday in the 80th year of his age.

Union miners in Wardner, Idaho, have denounced the A. P. A. and refuse to allow members of that body to work in the mines there.

A three-stamp battery, run by an 8-H. P. gasoline engine, is now at the Rose Hill mine, Nevada Co., the forerunner of a more pretentious plant.

Lead has been found in the sandstone in Salina canyon, Utah. Silver was found in paying quantities in sandstone in Utah twenty years ago.

Manager Dern of the Mercur, Utah, mine has about determined to build a plant in Salt Lake of sufficient capacity to handle the Mercur cyanides.

The Oro Fino mine, three miles from Nevada City, is being developed anew, has been renamed the Stanford, and will have a ten-stamp mill this month.

Geo. Mainhart has a bond on the Fortuna mine, near Nevada City, and is having it pumped out preparatory to developing what is deemed a valuable property.

T. J. Nichols, treasurer of the Placer County Miners' Association, informs the Colfax *Sentinel* that contributions to the miners' fund in that county aggregate over $1000.

The time for filing protests with the Land Office at Sacramento against the issuing of patents to the railroad company for lands which are mineral, expires to-day.

It is claimed that $60,000 has been spent on the Hocumac mines located on "Old Baldy," Ontario, San Bernardino County. Omaha capitalists are pushing developments.

A man named Grossmann, who claims to be a mining expert, is under arrest at Reno, Nev., charged with conveying fictitious deeds to mining property in the Pine Nut district.

The only mine in Pioche, Nevada, now in operation is the Yuba, which is being worked under lease by Lloyd & Swindler, and is producing some ore that will stand shipment.

Twenty men left Selma, Fresno Co., this week for Alaska, under the leadership of F. Deesy, who claims to have authentic information of the existence of placer mines at Cook's Inlet.

The Finch Mining and Dredging Company, working on the Fraser, five miles north of Lytton, B. C., are reported to be making $20 an hour, the cost of operating the plant being $20 a day.

The Virginia Mining and Milling Company has incorporated in Los Angeles; capital stock, $500,000; J. M. Witmer, H. H. Russell, H. F. Hartzell, A. W. Davis, C. G. Van Fleet, directors.

Thirty men are employed at the Mt. Jackson quicksilver mine, fourteen miles from Healdsburg, Sonoma Co. There are 250 tons cinnabar ore on the dump. The April output was 187 flasks.

The Mountain Chief Mining Company has incorporated at Oroville, Butte Co.: capital stock, $8000; directors, G. M. Graysen, Jr., C. L. Donahoe, J. F. Sersamons, W. H. Sale and J. H. Graves.

Though there is still plenty of gold in the mountains, the Mariposa *Gazette* thinks that the prospector who works but an hour a day and plays pedro the rest of the time is not going to find much of it.

The Central Pacific R. R. Co. advertises in the Nevada *Herald*, of the 2d inst., that "Lands covered by actual mining claims, which are being operated as mines, will be relinquished without consideration."

After a dormancy of nearly two years, the Hunter mine at Mullan, Idaho, again prepared to resume operations but the customary labor troubles in that region compelled the superintendent to abandon the project.

The Eureka Consolidated will now go ahead and let some new contracts. The suits of Keyes and Arents against the company, which were on appeal at Washington, D. C., have been decided in favor of the company.

The Garfield mine at Atlantic City, Idaho, is now turning out $150 a day in gold, working only during the day-time. A new six-foot vein has been struck, which is one of the best ore bodies ever found in that famous mine.

The Inter-Ocean Mining Company, capital stock $500,000, has filed articles of incorporation at Rawlins, Wyoming. The trustees are W. Hatton, F. Moore, W. J. Cran, C. C. Marshall, J. H. Stewart, S. S. Blanchard, F. Menking.

The *Courier* says the Montgomery gold mines in southern Nye Co., Nevada, are looking well and another Huntington mill is to be erected. Thirty new tents have been pitched in the district in the last month by prospectors and miners.

W. C. D. Body has been awarded the contract to erect the ten additional stamps at the W. Y. O. D. mine, Grass Valley. No new structure will be erected, but the present mill will be widened. The contract for machinery has not yet been let.

Large bodies of elatente, ozocente and gilsenite are reported discovered in eastern Utah and western Colorado. Denver men are credited with intent "to open up the mines and commence the manufacture of rubber goods and candles."

The Nimshew Gold Mining Company has incorporated in Butte county; principal place of business, San Francisco; capital stock, $100,000, $5000 actually subscribed; directors, J. M. Wells, G. R. Fletcher, J. R. Davidson, W. B. Hamilton and D. Gutmann.

Forty-six companies mining on the Witwatersrand employ 2345 stamps to mill on an average 262,897 tons of "banket" per month. The average quantity of stone crushed per stamp per diem is stated to be 4.23 tons, and the gold yield 8.91 dwt. per ton, valued at £1 12s 1d.

Extensive developments on the Sunnyside and Beckwith Consolidated Gravel mines on the McRea ridge, Plumas county, give good promise of satisfactory yield. That part of Plumas county is a promising field for moneyed men to develop rich gravel and quartz mines.

A shipment of $61,689 in gold was received this week from the Alaska-Treadwell mine, representing the run of the mill for thirty days, during which 23,039 tons of ore were worked, averaging $2.68 per ton, and 243 tons sulphurets were treated. The gross expenses in April were $26,782.

The Basin, Montana, *Times* dejectedly says: "If ever the placer miners looked down in the mouth it is in the present year of our Lord. No water, no diggin's. The hills are about bare of snow, with prospects of a mighty short season's run for these gray-bearded old grizzlies of the Rockies."

The first Northern Pacific patent to lieu lands ever received in that district arrived at Spokane, Wash., this week. It covers 16,192 acres, nearly all of which is in Lincoln county, and much of which, it is said, is occupied by men who have delayed filing contests, thinking there would be "plenty of time."

Last fall a man named Springer gave another named Lewis verbal permission to sell a Trail Creek claim, keeping all he got over $1000. After some time Lewis got $1500, but Springer refused to pass the title, as the claim would now bring $50,000. The county court has held that Springer must make the transfer.

The men who engage California miners to take charge of important South African enterprises pay princely salaries. Harry Webb gets $15,000 per annum: R. H. Cavill $7500. Jno. Hays Hammond's $60,000 is as much as is paid the President of the United States and a justice of the Supreme Court of the United States.

The Calumet and Hecla, Mich., copper mine pays a $500,000 dividend to-day: this makes an aggregate of $41,850,000 cash dividends that great property has paid to date. The Tharsis copper mine, a European property, is another great dividend-payer. A $625,000 dividend was paid yesterday, being a total of $26,292,160 to date.

The Trinity County Miners' Association has raised in addition to previous donations $100 to second the efforts of the State Miners' Association in securing the mineral lands against the claims of the railroad. In addition to this, Hon. John McMurray went among the business men of Weaverville and obtained about $100 more.

The United States Census Bureau, in mining statistics, shows that the labor employed in the actual production of the precious metals averages $725 per year: the average output per man amounts to $1723 a year. Mining pays higher wages to the laborer and better profits to the employer than any other business carried on in the United States.

The Birkbeck Investment, Security and Savings Company of Toronto, has incorporated to mine in British Columbia. The Finch Mining Company, limited, of Pittsburg, Penn., has likewise incorporated; capital stock, $6,000. A new limited liability company is the Vancouver Gold and Silver Exploration and Concessions Company, of Vancouver; capital stock, $500,000.

The Mojave *Miner* hears that reorganization of the Mammoth Mining Company is in contemplation, and that the principal English stockholders are now on their way to this country for that purpose. The Mammoth is in Pinal county, and is one of the largest and richest gold mines in Arizona. The new organization will expend about $200,000 in improvements, among which will be the removal of the mill from the San Pedro river to the mine and the increase of its capacity to 100 stamps.

Sam'l Collyer, of the Tacoma, Wash., Chamber of Commerce, sends the following statement of the Tacoma Smelting and Refining Co. for the month of April, 1895: Number of men employed, 61; pay-roll, $4,327.31; wood-choppers and teams, $680; total pay-roll, $5 007.31. Product: 2200 bars bullion, weighing 227,508 pounds. Contents: 1315.04 ounces gold at $20.67—$27,181.87; 21,959.61 ounces silver at 66¼ cents —$14,603.14; 225,913 pounds lead at $2.95 per cwt.—$6664.44; total, $48,449.45.

A. R. Hammond—who has been retained as consulting engineer to the Franco Syndicate, started by Parisian financiers with £400,000 capital, half of which was subscribed in London, to explore and develop large concessions obtained from the Portuguese Government from the Guenene to the Congo, eastward to the head-waters of the Zambesi on the borders of the Barotseland, South Africa,—is organizing an expedition to examine its mineral resources, and the practicability of constructing a light railway from the coast to the Upper Zambesi regions.

The West Le Roi & Josie Consolidated Mining Company has been incorporated at Spokane, Wash.; capital stock, $500,000. The incorporators are G. H. Casey, C. Griffith, D. Holzman, S. I. Silverman, J. M. Burke, J. B. Jones, R. Thompson, H. M. Stephens. The primary object is to carry on a mining business in the Trail Creek District, British Columbia. The Great Western Mining Company, which recently incorporated there, has organized. The officers are L. Bertonneau, president; J. B. Jones, vice-president; H. M. Stephens, secretary and treasurer, M. Burke, manager.

Under date of the 1st, Stephen Barton, who has charge of the canal work now in construction in Kern Co., writes from Kernville, that the company engaged in constructing the electric canal under his charge is incorporating. The company name has not been yet selected. The works will be near Keysville; the postoffice address for the present will be Kernville. The men engaged in this enterprise are mainly residents of Chicago. "The work, so far, looks to a canal sixty-five feet wide and five feet deep, and is expected to have a carrying capacity of 700 cubic feet per second and a fall of 350 feet."

The Ibex, Utah, mine was attached last week for an unpaid note of $10,000, which was followed by other claims. A Salt Lake man who claims to be posted says that the mine had produced $350,000 worth of ore since its purchase in 1894; that but $50,000 had been paid on the purchase price, and that the smelter involved an expenditure of $80,000, which makes a total of $130,000. This leaves at least $220,000 to cover the cost of operating the mine. A plant which has cost but $130,000 and has produced $350,000 in the time it has been held by the owners is not a bad proposition, and somebody seems to have made money out of it.

The *Record-Union* is now after the quartz miners, and says that the quartz grit coming from the stamp mills "is the most injurious form of debris." First, it was hydraulic mining that incurred the *Record-Union's* displeasure; then drift mining came under the ban, and now the poor quartz miners are excommunicated. With butter at ten cents a pound, the man who makes two blades of grass grow where but one grew before is a public benefactor; with gold at $20.67 an ounce, the man who adds an ounce or a ton of it to the commonwealth is a villain. By its malicious exaggeration and manifest unfairness the *Record-Union* has destroyed its influence and neutralized the effect of its assertions.

The Oregon & California Railroad Company has applied for patent to another lot of land in southern Oregon, aggregating about 12,000 acres. Some of these lands are situated in Douglas county, more in the extreme western part of Jackson county. Mineral land is included and those interested in that section should investigate the descriptions carefully. The lists were filed with the officers of the Roseburg land office April 23d, and sixty days from that date are allowed for the filing of protests or contests against the claim of the railroad company on the grounds that the land is more valuable for mineral than for agricultural purposes. These protests should be filed with the Roseburg land office officials.

Prospectors along the Columbia have thought that if they could only cross over on the reservation they could pan out gold, and some have tried it, but all have recently given up the job. When the Indians found that the Boston men were mining on their side of the river they at once ordered them away. All kinds of barters and propositions made by the white men to remain were dismissed without ceremony by Siwashes, and the whites bad to vamoose. One of the miners is said to have been so provoked upon being driven across the river that he secured an old needle gun and took a shot across the river at the first Siwash he saw. Now the Indians are worked up and threaten to shoot anybody found trespassing on the reservation.

W. G. Riffenbero, of San Diego, is about ready to put in operation his plan for placer mining in the Colorado river, and will begin at Temple Bar. He has built two catamarans which he will anchor in mid-stream by steel cables up and down the river so that the boats will remain stationary. Two wheels, twenty feet in diameter and with a twenty foot breast each, will be placed between these catamarans and attached to the them, so that the current will revolve them. These wheels are expected to develop 140-horse power. Located on the catamarans will be two pumps, operated by the wheels, to irrigate. The ropes will be so adjusted that they will permit of a twenty foot rise in the river without any inconvenience to the boats or wheels, and appliances are also provided for protecting the boats and wheels from drift, and in case of extraordinary high water, for swinging them into the shore. The boats are built, the two pumps are at Kingman and will be placed in position this week. The plant will cost $15,000, and if successful, this amount will soon be realized from washing gold out of the gravel on Temple Bar.

The Sutro Tunnel—"The Comstock Tunnel Company," has an income of $2800 per month; its monthly expenses are about one-half that. The recent change in the ownership of that famous bore, which, with its branches drains the Comstock to the depth of 1600 feet, encourages the belief that active mining and development work will be pushed. Under the rule of the late owners little was done except to keep up repairs on the new tunnel. The new owners will, it is said, put the property in good condition, clean out and repair the branches that run north and south along the front of the lode, when they will hold in command all the Comstock mines from the level of the tunnel to the surface, and all the unexplored "west country" lying back of the lode. It is understood to be the intention of the new owners to encourage the extraction of the numerous deposits of low-grade ores known to exist at several points along the lode in the old levels between the tunnel level and the surface. As in working from below upward, every pound of rock and ore excavated will descend to the tunnel level by force of gravity, exploration and all other work may be done more rapidly and cheaply than is now being done by working downward and hoisting both ore and waste rock by steam power. In working upward there need be but little handling of the material excavated, as chutes can carry the ore and rock down to the cars plying in the tunnel.

It is estimated that the Transvaal mines lose £300,000 a year by the inability to treat slimes. How to recover this by profitable treatment is a question now discussed on the Randt, and "developments of distinct importance for gold mining are promised in the attention directed to the solution of this problem. In one quarter the whole merits of dry crushing to prevent slimes and direct cyanidation are being debated, while, in another, practical efforts are attempted to separately deal with slimes, and thus avoid the interference with existing plants which the first proposal would involve." It is claimed that, with rich slimes containing about 7dwt. of gold to the ton, successful treatment has already been achieved. By means of disintegration and subsequent pressure, 98% of gold has been obtained at a cost of 10s. per ton. The bulk of gold slimes, however, does not carry more than 3dwt or 4dwt to the ton, and obviously it would not pay to deal with them in this manner. It cannot be said that any actual working success has attended the experiments with poorer slimes; but several processes have appeared so far promising of practical results that trial plants have been erected at different South African gold mines. One of these aims at improving the precipitation of gold from dilute solution, which is sought to be effected by preserving the chemical purity of the zinc, and by the addition of an electro-negative element.

Our Largest Lake.

Herewith is illustrated Lake Tahoe—that greatest of all the mountain lakes of the Sierra Nevada. The lake occupies an elevated valley at a point where this mountain system divides into two ranges. It is, as it were, engulfed between two lofty and nearly parallel ridges lying to the east and west of the lake. As the higher range is on the west, the lake belongs to the eastern slope of the Sierra Nevada. The boundary between California and Nevada corners in the center of the lake, and this point is not changed, though recent surveys have inclined the southerly extension of the line eastward, so that California gets more territory.

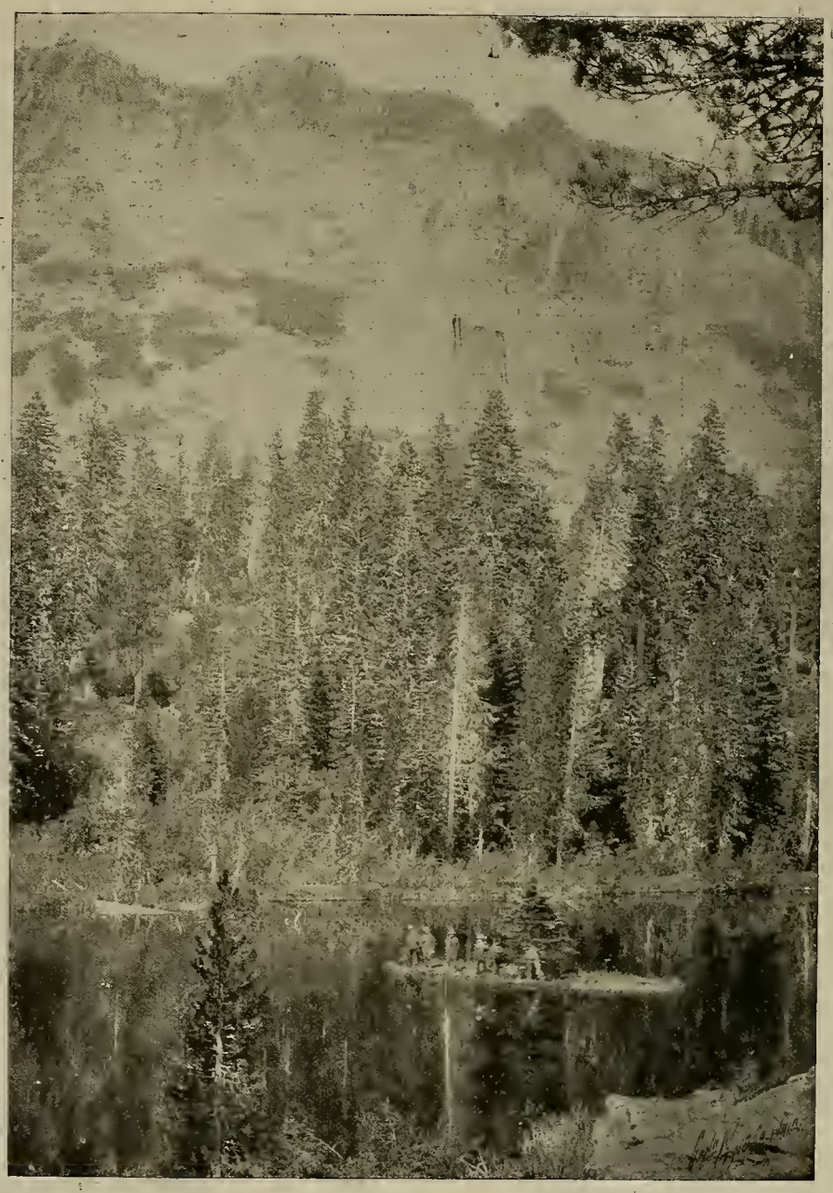
Lake Tahoe is over twenty-one miles in its greatest length and twelve miles in its greatest width; and calculating irregularities of outline, the water surface is about 200 square miles. It derives its waters from a watershed of 500 square miles and more than 100 affluents of various capacities, deriving their waters from the amphitheater of snow-clad mountains which rise on all sides from 7000 to 12,000 feet. The only outlet from the lake is Truckee river, which carries the surplus waters from a point on its northwestern shore, out through a gorge to the plains of Nevada and thence to Pyramid lake.

Lake Tahoe was first seen by Fremont, after information of its existence from the Indians. It has had various names. By statute of California it is Lake Bigler, but usage has now fully established the name Tahoe, which is said to be a Washoe Indian word meaning "Big Water" or "Deep Water," though some claim that the word simply means "Fish Lake."

Tahoe impresses all visitors as a grand piece of water. Its great size, when one considers its lofty perch amid the mountain summits, is profoundly impressive. The depth of its waters also strike one with awe. Local declarations of its depth, in connection with the fact that sunken bodies do not rise, and the speed with which dangerous squalls arise without warning—all combine to make the visitor shudder while he admires. The depth of the water is usually exaggerated, although the demonstrated depth of 1645 feet, established by Dr. John Leconte, makes it deeper than the profoundest of the Swiss lakes.

The charms of Tahoe are beyond enumeration. The peculiar hues of its waters at places of varying depth are entrancing. The coolness and purity of its water at all points are notable and it is not wonderful that it should stand as the ideal source of water supplies for the cities of central California, when population and wealth shall justify the necessary expenditure.

Our engraving gives a glimpse of one of the most popular arms of the lake, known as Emerald Bay, situated near its southwest corner. This bay has a charming green hue to its water. It is surrounded by a fringe of timber, while the rocky and often snow-mantled mountain sides beyond the timber rise in majestic forms and dimensions. The picture shows only a part of Emerald Bay. It has wider waters and larger islands, but the photographer has chosen a point where an object of much interest is in sight—a floating island sustaining tree growth and capable of sustaining quite a cargo of tourists, as the picture shows.



FLOATING ISLAND IN EMERALD BAY, LAKE TAHOE, CALIFORNIA.

THE work of weighing the mails in order to settle upon the amounts to be paid to railway companies for their transportation is finished in the middle section. The weighing began on April 1 and terminated on the 30th. For the purpose of these weighings the whole country is divided into four districts, corresponding nearly to the east, south, middle and western sections of the country. The mails of but one section are weighed each year, and the results obtained are used as a basis for computation for four years, until the turn of the section comes around again. The weighing is done either in the spring or the fall, as the winter mails are unduly heavy and in summer unduly light. When the work is finished contracts are made with the roads. The Government pays $42.75 per annum for carrying 200 pounds of mail daily per mile of route. For 500 pounds $64.12 is paid; for 1000 pounds $85.50, and so on. Land-grant railroads receive 20 per cent less than these rates.

The Man from Cassiar.

St. Peter (to applicant)—You say that while on earth you mined in the Cassiar. Now tell me, did you ever lie to your fellow beings about that country?

Applicant—No, saint, I have always told the truth.

St. Peter—You never told that you took out a hundred ounces to the pan, that you used frozen quicksilver for bullets, that smoke clung to the branches of trees in great frozen clouds, and when you addressed your partner he had to wait until spring for the sound to thaw out?

Applicant—No, saint, I never told such things.

St. Peter—You didn't, eh? Well, then, you're lying to me now, for if you never told those things you never came from the Cassiar. Here, Paul, take this man below.—Alaska Mining Record.

IT IS ASTONISHING how very low the cost of producing steel ingots and rails, in the item of labor, has now fallen, owing to the economies effected in the manner of labor-saving machinery and improved methods of working. It will hardly be believed that in Great Britain the labor cost of producing a ton of steel ingots, whether at Bessemer converters or open-hearth furnaces, does not exceed 4s. per ton, and in the best practice is probably not much over 3s. The chief items are pig, steel, scrap; coal and ferro-manganese—the total cost varying from £3 6s. to £3 10s. per ton. In the United States, although wages are nominally higher, the cost is not greatly different.—London Iron and Coal Trades Review.

THE waters of North America, which means the Gulf of Mexico, the two great oceans and the rivers, creeks and lakes, are stocked with 1800 different varieties of fish. Of the above number 500 are peculiar to the Pacific and about 600 to the rivers, creeks and lakes.

Co-operative Contract System Successful.

On several occasions the co-operative contract system of doing shop work, first described by an Eastern exchange, has been mentioned in these columns. This is a system which is said to be far superior to the day-work plan, the purely piece-work method, or any of the various schemes proposed for profit sharing, between the employer and the employe. This system has been established in one of the largest electrical manufacturing establishments in the country and its operations are explained by an exchange. When it was decided that all the men should work together and share in the profits the first thing necessary was to fix a basis. In a certain department, prior to the introduction of the new system, each man was rated at a certain sum per hour, supposed to be adjusted according to merit. Taking that rating and the number of hours worked during the week, as a basis, the distribution was made as follows: A. is rated at 25 cents per hour, B. 20. A. works 60 hours, B. 50. Their earnings, according to rate, being $15 and $10, respectively; a total of $25. The product of their labor for that week, according to the price paid for it, amounted to $30, leaving a profit of $5. As A. earned 60 per cent of the $25, he should be entitled to 60 per cent of the profits, or $3, which, added to the $15, makes his entire wages $18. And as B.'s earnings only show 40 per cent he can claim only 40 per cent of the profits, or $2, making his total for the week $12.

The gentleman, in describing the results of the system, says that no more equitable system of distribution could be imagined. Gangs were organized throughout the works, each with its leader or gang boss, who was rated slightly higher than the others. A co-operative gang unloaded the raw material from the cars, another made the packing cases for the finished product, another packed it into the cases ready for shipment, and still another placed it on the cars, and throughout all the different departments, where the requirements demand it, gangs were organized, and, in fact, some places where the requirements did not demand it. For instance, engines were built co-operatively, although a price was recorded for the necessary operations on each separate part; all completed parts being reported by operations, and credited to the gang, instead of the individual.

After a thorough test of the system, the gentleman referred to expresses the opinion that an establishment conducted on the day-work plan cannot compete with one on piece-work, and that the majority of failures in industrial lines throughout the country may be attributed to the day-work system. We give the statements made in the foregoing because any plan by which it is claimed that the relations between labor and capital can be made more harmonious should receive attention.—American Manufacturer.

BUSINESS never was in a condition to suit everybody. Legislation can't help the man who won't work, or the man who prefers to growl at every one else rather than make an honest, industrious effort himself. Legislation cannot prevent the daily demand for bread and butter, and the first duty of every man is to earn that. The times always improve when all hands go to work with a will, drop grumbling, hunting for the bright things of life rather than its unpleasant features.

TO TEST LEATHER BELTING, says an exchange, cut out a small piece of the belt and place it in vinegar. If the leather has been perfectly tanned and is therefore of good quality, it will remain immersed in vinegar even for several months without any other change than becoming a little darker in color. If it is not well impregnated with tanning, the fibers will promptly swell and after a short time be converted into a gelatinous mass.

SMALL LEAKS are not thought to amount to much, but an English engineer shows that a hole $\frac{1}{16}$-inch in diameter with a water pressure of only 45 pounds will get away with 648 gallons per day.

South African Gold Mines.

Johannesburg, South Africa, has about the same altitude as Eureka, Nevada—5600 feet. The Witwatersrandt reef and the coal deposits adjacent thereto make the place famous. Probably in no other mining camp in the world will so many mills, hoisting works, chlorination works and cyanide works be seen in such rapid succession and for so long a distance as upon the "Randt." Water for the works is obtained from springs, the mines and every available source, and is pumped into reservoirs and used over and over again until it is white with slime.

The Witwatersrandt gold-bearing reef seems to have been a basin formed by aqueous deposit and running in an easterly and westerly direction, cemented together and forming a conglomerate mass, locally termed "banket."

By some disturbance of nature, it was uplifted at an angle of about 35°, thus forming the present continuous lode or reef, broken by intrusive dykes of diorite or greenstone. Then there seems to have been a solfataric action from below which formed a vent in the parpus conglomerate, therein depositing sulphurets or sulphides of iron containing gold. In time, atmospheric action desulphurized and oxidized the iron, leaving some of the gold free, while some, no doubt, owes its free state to the precipitating action of iron. The country rocks of the Randt are chiefly sandstone cherts, shales, quartzite and granite, the conglomerate reef spoken of lying between these formations and averaging several feet in thickness. The Randt is a great low-grade proposition and is handled as such, and in the opinion of many is not worked so much for the actual profit in it as for the stock jobbing operations it affords.

But few of the mines are paying handsomely; others are paying not more than six or seven per cent upon their very large capital, while others are not paying at all, and, as an old miner remarks: "These companies have a way of making dividends appear all right on paper, but at the same time they are in debt to the bank and borrowing more money to go on with."

It is thought that the cyanide process, which extracts the gold from the tailings, is the salvation of the Randt, and that what dividends were paid come from this source. The Johannesburgers seem to think the mines will last forever, but, in the opinion of well-informed people, fifteen years will be a long life for these properties, worked as they are with the enormous force in actual operation, and then Johannesburg—the city of whirlwinds and dust storms—will meet the fate of many another mining camp, and houses, lots and machinery will be for sale cheap as dirt unless some unforeseen discovery should take place, which is hardly probable, as the country has been well prospected and taken up.

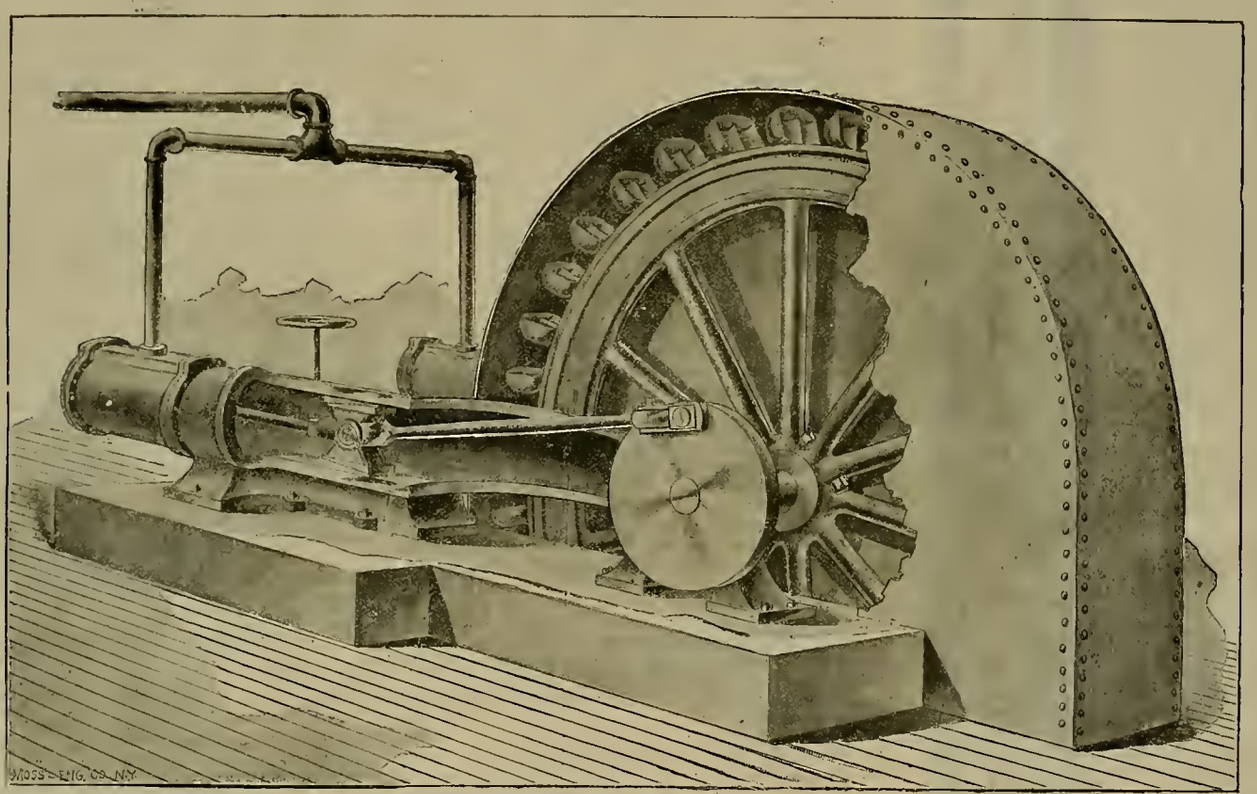
The mining laws of the country are stringent and peculiar, only 150 feet along the croppings by 400 feet in width being allowed; and as the reef dips at an angle of 35°, the holder of a claim would soon work out his mine, he not being permitted to follow the dip of the reef outside of his boundary lines. This state of affairs gave rise to what is known as the deep level claims, hence the whole country is pegged off as deep levels. Shafts are being sunk at some of these that will tap the reef at a depth, but it remains to be proven whether these deep level mines, as they are called, will be paying ventures.

A great problem arises in mining this reef, and that is the disposition of the tailings, there being no streams or other outlets for the immense amount of ore crushed. The tailings accumulate in immense piles of fine sand and slime, which, upon being dried, are taken up by the wind and blown in every direction. These tailings having passed through the cyanide solution are thoroughly impregnated with the deadly poison; and, when blown about, must certainly cause much cyanide poisoning by the inhalation of the fine dried particles held in suspension.

As an American would put it, the Boers seem to delight in getting a "lead pipe cinch" on the English, and hence have proceeded to tax everything from a mining claim to a needle. There is little which has escaped taxation, and this has been carried to such an outrageous extent that a most bitter feeling prevails among the people, whose capital, energy and enterprise have given prosperity to the Transvaal and elevated a little bankrupt republic to the dignity of a nation, having a surplus of £1,000,000 in the treasury.

British residents have been, by a recent law, prevented from obtaining the franchise and so excluded from all hope of getting redress by constitutional means. A monstrous law has been passed denying foreign residents the right of public meeting in the open air, and limiting indoor meetings to five persons. Such an attempt to stifle free speech and to prevent the public from the ventilation of grievances is despotism.

There are 3200 stamps in operation—about as many as in all California; their daily crushing is said to average four tons to the stamp—a bigger average than in our State. About seventy mines are in operation. It is expected to add 1000 stamps this year. A little over 2,000,000 ounces was produced in '94—the gold being worth £3 10s per ounce.



PELTON WHEEL DRIVING AIR COMPRESSOR.

Removing Cinders.

A hint on the removal of cinders and grits from the eye may not be amiss. The inner surface of the eyelids is ridged in such a way as to promote the moving of small particles towards the inner corner of the eyes, where the duct opens which leads to the nose. This is the particular fact on which this advice is based, and which also shows the extreme folly of the method usually adopted to extract cinders from the eye. This method is to double up the forefinger and rub it into the afflicted eye until it as red as a beet-root and suffused with tears. Some horrible contortions of the countenance are thrown in, as if to assist. Now, the only effect that such a course can have is to grind the cinder into the corrugations of the eyelid and keep it there for a week until the inflammation subsides. The proper way to do this is to catch up the eyelid by the skin and pull it away from the eye ball gently and repeatedly. This not only instantly relieves the pain, but promotes the shifting of the cinder in the right direction. In almost every case this will be found a speedy and painless remedy.

Pelton Wheel Driving Air Compressor.

The accompanying illustration shows a Rand duplex air compressor driven by a Pelton wheel mounted directly on the crank shaft of compressor. The wheel in the cut shown is 14 feet in diameter and works under a water head of 400 feet, this large diameter being required to give proper speed to the compressor.

The wheel, as will be observed, not only furnishes the motor power but is sufficiently heavy to serve as a balance wheel.

The advantages of attaching the wheels to the compressor shafts are: great economy of power, as well as in first cost, as also lessened cost of freight—a matter of first importance in machinery destined to places remote and difficult of access. The advantages so simple and efficient a connection afford are also manifest in the lessened cost of setting up the machinery, as well as in the absence of belt connections, the maintenance of which, with loss of power involved, are matters of the greatest importance in many mining localities, where every pound of water must be made to do its utmost duty.

This application of the Pelton wheel is made with equal facility to all forms of compressors, as well as blowers and many other classes of machinery, and in all cases where the head admits, the wheel can be made heavy enough to serve as a fly wheel, thus simplifying and cheapening still more this manner of applying power. Wheels in such cases may be made of any size, ranging from 6 up to 12 or 16 feet in diameter, as may be necessary to give proper speed to the machinery they are designed to run, suiting the buckets and nozzle delivery to conditions as to head and power requirement.

THE conning tower of a modern iron-clad warship is only a bombproof pilot-house whence the ship may be steered in time of action, and is not primarily a safe post where there may be kept an outlook upon the enemy. Conning is a very old word for directing the act of steering a ship. It comes from the ancient word "con," to know, to watch, and the conning tower really comes pretty close to a cunning tower, though there may be a certain touch of the whimsical in the idea.

THE unequal thickness of an envelope, caused by the overlapped edges, pasted or unpasted, sometimes affects the beauty and distinctness of addresses printed with a typewriter. An envelope has therefore been devised, cut from a piece of paper of such shape that the folds will not come under the address.

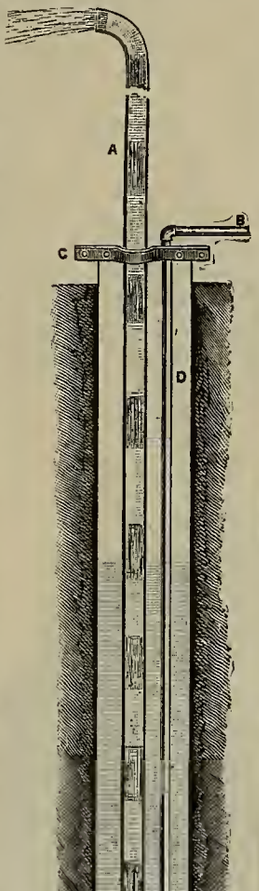
A STEEL CABLE one and one-half inches in diameter, traveling twelve miles an hour, can transmit nearly 2000 horse power.

Pohle Air Lift Pump.

Illustration is given on this page to the Pohle air lift pump, for pumping water by compressed air, made by the Ingersoll-Sergeant Drill Co.

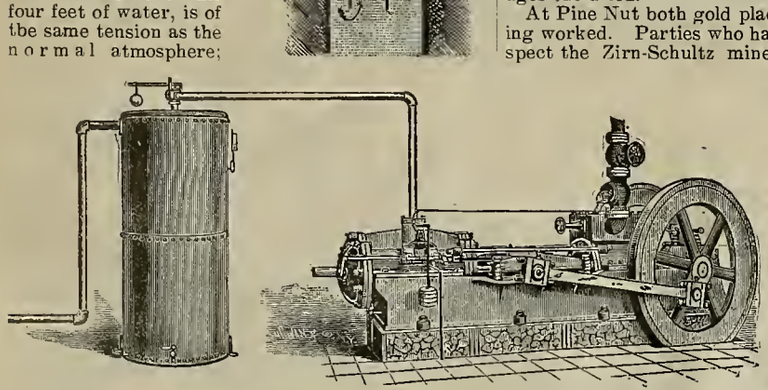
The working principle of this pump is thus explained by the manufacturers:

"In pumping, compressed air is forced through the air pump into the enlarged end at the bottom of the water pipe, thence by the inherent expansive force of the compressed air, layers or pistons of air are formed in the water pipe, which lift and discharge the water layers through the upper end of the water discbarge pipe. At the beginning of the operation, the water surface outside of the pipe and the water surface inside of the pipe are at the same level, hence the vertical pressures per square inch are equal at the submerged end of the pipe, outside and inside. As air is forced into the lower end of the water pipe it forms alternate layers with the water, so that the pressure per square inch of the column thus made up of air and water, as it rises inside of the water pipe, is less than the pressure of water per square inch outside of the pipe. Owing to this difference of pressure, the water flows continually from the outside to witbin the water pipe by gravity force, and its ascent through the pipe is free from shock, jar, or noise of any kind.



"These air sections, or strata of compressed air, form water-tight bodies, which, in their ascent in the act of pumping, permit no 'slipping' or back flow of water. As each air stratum progresses upwards to the spout, it expands on its way in proportion as the overlying weight of water is diminished by its discharge, so that the air section, which may have been, say, 50 lbs. per square inch at first, will be only 1.74 lbs. when it underlies a water layer of four feet in length at the spout, until finally this air section, when it lifts up and throws out this four feet of water, is of the same tension as the normal atmosphere; thus proving that the whole of its energy was used in work, and that this pump is a perfect expansion engine.

"As the weight of the water outside of the discharge pipe (the head) is one-third greater per square inch than the aggregate water sections within the pipe when in operation, it follows that the energy due to this one-third greater weight is utilized in overcoming the resistance of entry into the pipe, and all the friction within it."



THE POHLE AIR LIFT PUMP.

Parke & Lacy Co., 21 and 23 Fremont St., San Francisco, are the coast agents.

The Mines of Nevada.

Written by DAN DE QUILLE.

The mining industry of Nevada is now narrowed down to the working of gold properties—gold-bearing quartz veins and the few placers found here and there in this State. No mines are now being worked for silver alone. It will not pay to mine silver at present anywhere in this State at its price as a commodity; indeed, it is only in exceptional instances that it will pay in any place in the United States or any other country in the world. Here and there bonanzas are found that are so rich that for a time silver can be so cheaply mined that profit can be made at 60 cents an ounce; but count all the work done on the veins of the district, county or State, and it will be found that every ounce of silver obtained has cost from $1.30 to $1.50. It is the same in gold mining. When a man is so fortunate as to hit upon a big deposit of rich ore near the surface he is often able to take out gold at a cost of from three to five dollars an ounce, or even less. But these rich pockets in gold veins and the bonanzas in silver veins are few and far between. They are the great prizes that all who engage in mining hope to secure, but where one man wins thousands lose, and other thousands merely obtain a sufficient amount of the precious metals to keep them alive and digging.

As a small amount of gold is now worth more than a large amount of silver, those of our people still engaged in mining look wholly to the yellow metal for their reward. All gold-bearing veins, both great and small, are being examined and prospected, and the placers are being raked over and worked in the best manner possible, most of them being in regions that are almost or quite waterless.

The most promising gold quartz camp in this part of the State at present is Silver Star district, situated in Esmeralda county. Colonel Ed Bozle, who has just returned from an examination of the mines of that place, is greatly pleased with what he there saw. He tells me it is a region that is full of veins of gold-bearing quartz, and on these he found about twenty mines that will pay. The veins are from four to twelve feet in width, and pay from $20 to $50 a ton. The veins are found to increase in width and richness as depth is attained. Although milling facilities are inadequate large amounts of gold are being taken out and in some of the mines first opened there is in sight ore to the value of several hundred thousand dollars. The mines are equal to the best that have been found in the eastern part of the State, along the Utah west line.

Silver Peak, to the eastward of Silver Star, bids fair to become a rich gold camp. A new thirty-stamp mill is being erected at the peak. W. J. Salkeld, the well-known millwright, has charge of the work. The State Line mill of forty stamps is also to be started up, which will give the Peak mines a total of seventy stamps. The mines are being put in order for Superintendent L. J. Hanchett, a man who has had a vast deal of experience in Pacific Coast mines.

At and about Hawthorne the gold veins are yielding as usual. The arrastras near Hawthorne, which do custom work, are kept in constant operation. They work the ore of the men owning small mines. Much of this ore yields $50 to $100 a ton. It is a good poor man's camp, as rich ore is found at or near the surface. The Lapanta, the oldest mine in the district, is looking better than before in some years. The vein has widened to four feet and averages $20 a ton.

At Pine Nut both gold placers and veins are being worked. Parties who have been allowed to inspect the Zirn-Schultz mine report a "perfect bonanza of large proportions, with many ounces of pure gold in sight." Other veins in the same range are rich in gold.

At most points there is a lack of water for working the placers. Gravel is being hauled to Anderson creek for washing. It pays $5 to the two-horse wagon load. Several men are at this work, and are able to make good wages. Three men and a team take out an average of $100 in four days. The leading mines of the Comstock are holding out well. In Con. Cal. & Virginia they have a new streak on the 1750 level that assays from $33 to $75 a ton. Average from the whole mine is $51.78 a ton. The Crown Point is yielding over 700 tons of ten-dollar gold ore a week. The Chollar ore is paying $24.48 a ton; Seg. Belcher, $26.90; Belcher, $27.19; Silver Hill, $50, and Hale & Norcross, $72.90.

Coast Industrial Notes.

—Nearly 800 men are now employed at the Mare Island navy yard.

—Petaluma will this season increase its shipment of basalt paving blocks.

—The Union Gas Engine Co. will put a gas engine in Chas. L. Fair's new yacht.

—An iron foundry has been established at Flagstaff, Arizona. The first heat was run off last week.

—The Los Angeles fiesta was not a fiasco. It cost $35,000, and the net profit was over $200,000.

—The Valley Road directors have justly rejected the China basin lease as proffered by the Harbor Commissioners—too restrictive.

—According to the Virginia, Nevada, *Enterprise*, at the Bailey sale in Churchill county last week, 100 head of horses went for thirteen cents apiece.

—Messrs. Coons and Nelson have acquired the rights of the Wheeler Electric Line Co., and propose building a road between Aberdeen and Hoquiam, Wash.

—Grant Brothers, who have taken the contract to build the Southern Pacific's new branch line into Pasadena, have begun the work and will push it through to early completion.

—The Northern Pacific will resume the work of arching the Stampede tunnel in the Cascades with brick this summer. A contract for 2,200,000 brick has been awarded to the Union Brick Works of Tacoma.

—Referring to the cheapness of cedar shingles, the Portland *Oregonian* says: "Sawn cedar shingles, the best in the market, are now to be purchased at $1.10 per thousand. A few years ago they sold for $2.75."

—President Wilson Hamilton of the Flagstaff, Durango & San Diego Railroad says his company has the necessary rolling stock and rails to commence work as soon as the survey is completed to Flagstaff, Arizona.

—Ten of the new cars for the Pasadena and Los Angeles electric railway have arrived there. Some of these cars are lettered "Los Angeles and Santa Monica," which indicates the ultimate use to which they are to be put.

—English parties have bought and will consolidate the entire electric street railway system of Portland, Or., with a total mileage of 128 miles. The purchase price is nearly $3,000,000. The original cost was about $2,750,000.

—The Union Iron Works is building a new style concentrator—the Union. They are finishing the new hoisting plant for the Brunswick mine, Nevada City, which will have a capacity to work the mine to a depth of 3000 feet.

—The Fulton Engineering and Shipbuilding Works is building a duplex tandem compound compressor, 220 H. P., driven by a Pelton water wheel, 19 feet diameter, 750-foot head, for the North Star Mining Co., Nevada City, and a compressor for the Golden Cross, San Diego Co., 100 H. P., with Corliss engine, surface condenser.

—The Washburn-Moen Manufacturing Co. of Worcester, Mass., through their coast agent, Frank L. Brown, No. 8 Pine street, have concluded arrangements for the absorption of the California Wire Works. The transfer includes the wire rope and cable plant of the latter company—the manufacturing part of their business.

—Mr. Felts is getting some very good notices of his electric primary battery in the Sacramento papers. The *Record-Union* wants to know, in a leading editorial devoted to Mr. Felts, why it is not possible that a California man has discovered what all electricians so long have sought, and mourned because they found it not. The mantle of Prof. Emme seems to have fallen on Felts.

—The Nevada County Electric Power Company's scheme is practicable and the directors are fast getting the project into tangible shape. The idea, as heretofore explained at length, is to supply power to the mines in Grass Valley and Nevada City districts, it being calculated that electric power can be furnished with the waters of the South Yuba at an annual rate of $75 per H. P.

—The recent high prices of petroleum have stimulated Los Angeles and Ventura oil prospectors, and tend to stimulate the oil trade with Peru, inaugurated by Grace & Co. They already have the Bawnmore running regularly, and have given the Union Iron Works a contract for an oilship, to be built especially for the South American coast petroleum carrying trade. The keel was laid last week.

—The electric power plant now being put in by the South Yuba Water Co. will cost $150,000. A pipe line from Long Valley to Newcastle will generate 1000 H. P. A pole line will be run to Newcastle. The main line will be continued to Rocklin and Sacramento. If the venture prove successful, enough more power can be generated from the company's ditches to equal 2500-horse power, which is sufficient to furnish lights for Sacramento and intermediate points.

—The Sacramento Board of City Trustees finally got together this week and by a vote of seven to two awarded the contract for the A 2 style of pump for the Sacramento city water works to the Edward P. Allis Company for $12,700. The bids for 4000 feet of six-inch water pipe, thirty-one pounds to the foot, were as follows: Baker & Hamilton, 44 cents per foot; Holbrook, Merrill & Stetson, 43.1 cents; Schaw, Ingram & Batcher, 43 cents. The contract was awarded to Schaw, Ingram & Batcher.

—Reports that the Stanford University would be closed at the end of the present term because of lack of funds to pay current expenses are unwarranted. The university has been forced to retrench since the death of Senator Stanford, and the Government suit has tied up a large amount of property on which ready money could be realized, but Mrs. Stanford's personal attorney says that she will never permit the doors to be closed, no matter what sacrifice she may be called upon to make, as even temporary suspension would be wellnigh fatal to the college. The Government suit for $15,000,000 against the Stanford estate, which has prevented distribution, comes up shortly.

—The battleship Oregon is at the Union Iron Works to at last receive the long-delayed armor plates. The latest test of these armor plates was made last week, an eighteen-inch nickel steel Harveyized Carnegie plate, representative of the second lot of 360 tons of side armor for the Oregon being tested with the most satisfactory results. The plate was first fired at with a Holtzer shell from a twelve-inch gun at a velocity of 1465 feet per second. This shell penetrated about five inches and was shattered. The second, or penetration shot, driven by a larger charge of powder at a much higher velocity, penetrated about nine inches, but the manner in which this plate stood the test was regarded by the ordnance officers as showing it to be the best yet tried. To still further test the qualities of the plate, an experimental shot from a thirteen-inch gun was ordered. A Carpenter projectile weighing 1100 pounds was sent at a velocity of 1810 feet per second, with an energy of 24,981 tons. This gun had never before been used in such tests. Although the shot developed a crack, the plate still held together, all the backing and structure behind being crushed. The ability of the plate to keep out other projectiles was shown by the fact that only one armor bolt in the backing was destroyed.

Scientific Progress.

A Difference in Custom.

An American visiting Europe is likely to be struck with the difference between the different European countries and this country in the matter of secrecy in regard to the shop manipulations. It is almost impossible to gain entrance to the large shops there, unless your efforts are seconded by some one of considerable influence, and even then you are rushed through without the chance for examining anything with any degree of closeness. You have all the time the feeling that you are an intruder, and that you are looked upon as having the intention to steal something, not something tangible, but something in the way of items.

While at the Paris exposition, says a writer in the *Tradesman*, I noticed some work in plate iron in which I was very much interested. It was from a large English works. I asked the man in charge of the exhibit as to the probability of being allowed to go through the works. He did not know, but advised that I write the company. I did so and received a reply by return mail granting permission. I had hardly finished reading the letter, which was addressed to the hotel at which I was stopping, when a telegram was handed me, signed by a higher official of the company, to the effect that they would allow no one to go through their works. Afterwards I learned of another American engineer who wrote them for similar permission and received the reply that they would not let him, nor even the President of the United States, see their processes of manufacture.

Soon after coming back to this country a young graduate of the technical school asked me for a letter of introduction to one of the largest and best known machine manufacturing establishments in the country. This I gave him and received a letter from the company thanking me for having done so and saying that they detailed a man who had been with them for many years to show the young man over the works, and at night had persuaded him that he had not seen all their processes he ought to see and had brought him to conclude to remain over and spend the next day in the shops. The contrast coming so quickly magnified the difference.

A day or two after being refused admission to the English shops I met a very intelligent man and incidentally learned from him that he had formerly been in the employ of the same English firm. From him I learned all I wanted to know about the process, as the whole matter on my part was one of curiosity only, except that I should have asked permission to say something in print about the works. I have no doubt that, with the assistance of this man, any good mechanical engineer could have almost literally duplicated the machinery and the operations in the works.

The keeping of trade secrets, especially those of machine shops and foundries, is almost too difficult a thing to be worth trying for; I believe the American practice in the best shops is right. In these shops customers can see for themselves that the processes are good, and future customers are made for the same reason. Let a machine manufacturer guard a secret as closely as he may, if another is determined to get hold of it he will do so, unless the manufacturer does all the work himself.

AUGUSTE STRINDBERG asserts in *Annales Industrielles*, as the result of numerous experiments made by him, that sulphur is a compound of carbon, oxygen and hydrogen, in proportions as yet undetermined. He goes still further than this, and claims that it is not only not a simple body, but not even an original one, being merely a common fossil resin or bitumen. He says that when sulphur is melted at about 120°, it disengages an odor of turpentine or camphor; and if a trace of iodine be added, the odor becomes more marked. If it be heated anew to between 160° and 230°, it loses oxygen and drops to the level of a caoutchouc, of which it assumes the color and consisteney. Then, if the brown and viscous liquid thus obtained be cooled, it preserves its nature for a certain length of time, and then resumes its state of resin.

The Gas Engine and the Steam Engine Joined.

Referring to the discussion of the gas-engine question, a prominent engineer remarked, in conversation, that he failed to see why the gas engine and the steam engine should not be compounded, so to speak. He put the case something in this manner: In the gas engine one of the problems is to keep the cylinder reasonably cool, and in the steam engine to keep the cylinder hot. Now, suppose we have a gas engine running and jacket its cylinder with water, which is then used for boiler-feed water, thus saving the heat which is now thrown away. Then take the exhaust from the gas engine through the jacket of the steam cylinder, and, if necessary, as it probably would be, add a heating chamber for the steam to pass through just before reaching the cylinder, so that more heating surface could be employed. Two such engines adapted to each other would probably mean a relatively small gas engine and a steam engine large enough to carry all the load in case the gas engine refused to work for any reason; and, arranged in this way, each would supplement the other so far as the proper distribution of heat is concerned. The proposition is a novel one, and there is a chance to do some thinking over it. Possibly some one may be so situated as to make it easy to try the plan and let us know the results.—American Machinist.

PROFESSOR CLARKE, of London, prophesies that diamonds of marketable size will soon be manufactured. M. Moissan, of Paris, has manufactured diamonds by melting wrought iron together with carbon, and permitting the mixture to cool very slowly. Under the conditions the carbon became crystallized. Simultaneously Mr. Kroutschoff, of St. Petersburg, got diamond crystals by a similar process, employing silver instead of iron. These artificial diamonds are scarcely big enough to be seen by the naked eye, but they represent the solution of the problem of crystallizing carbon. Dealing with the way diamonds are formed by nature, Prof. Clarke gives the opinion that eruptive matter from deep in the earth bursts out through upper layers of shale, the latter being rich in carbon. Slow cooling follows, and the carbon is crystallized as in the experiments of M. Moissan and Mr. Kroutschoff.

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Mechanical Progress.

Does Away With the Dead Center.

An engine without "dead centers," and one which will utilize the full force and power of the steam during the whole length of the stroke of the piston, both forward and backward, has been the dream of the inventor for centuries, and that a Salt Lake man has finally accomplished it will be a signal for congratulation, says the Salt Lake *Tribune* of April 29th.

The laurel falls at the feet of James Hayton, a modest little man of some 50 years or more, who gave an exhibition of his machine yesterday afternoon at 2 o'clock in McClure's machine shop, on Green, near Pear street, where the machine was in operation, and invited all to enter. The first and only machine for practical operation that has been built was there, to be seen in full gear and rigging, and while it is a diminutive affair, at the same time it exerts a two-horse power and affords energy enough to operate the machinery of the McClure machine shop, whereas, prior to its advent, an ordinary engine of four-horse power was used.

For six years inventor Hayton has been working upon the principle, and yesterday when the steam was turned on in the presence of the visitors, it was with the consciousness that he had mastered the problem that had baffled so many.

Persons familiar with steam are aware that the ordinary standard engine does its work during a small part of the stroke of the piston—that is, while the crank is at the highest and lowest points of the circle described by it. At the opposite horizontal points of the circle are the dead centers, when the steam is exercising no power and doing no work. The crank, as the machinist will understand, must be carried past these dead centers by the fly wheel, and this is just what the invention whose performances were witnessed by a large number of mining men and machinists yesterday has accomplished.

It successfully does away with the crank, and converts the reciprocal motion of the piston into a circular motion on the driving shaft, revolving continuously with all the force of the crank until at full lever.

The engine, while exercising but two-horse power, with thirty pounds of steam pressure, runs the lathes, drill, planers and other machines contained in the establishment.

The inventor claims that his engine may be constructed in any size, from a one-horse power to 5000-horse power, and that it will ultimately set aside the old standard engine now in use.

The visitors were very much pleased with the exhibition.

SHAFTING is very greatly handicapped by the faulty application of the pulleys and belts. The most serious error made in this connection is that of running unreasonably tight belts. It is amazing how much power is wasted in this way, to say nothing of the trouble of broken pulleys, hot boxes, etc. The enormous and absolutely useless pressure thus put upon the pulleys must in time break them, besides wearing out the system of shafting and bearings. If manufacturers realized what these ridiculously tight belts cost them in a year, they would give vent to some very strong and expressive language. It has been calculated by several eminent engineers that the loss of power, from friction alone, in some of the best equipped mills in the country, is from 22% to as high as 39%. It is unreasonable to suppose that the minimum friction would consume this amount of power, and no other cause is so potent in increasing friction as undue tightness of belts, which, when they number by hundreds in a mill, easily account for the great loss of power referred to.

SAYS a writer on mechanics: A man in charge of a small boiler has had a conflict with one of his numerous bosses. The boiler leaked at one of the fittings and the fireman saved the water and would use it over again. The boss observed this and ordered him to quit it, and finally went to the owner and complained, saying that the fireman was using water that had been through the boiler and "had all the steam taken out of it." This is another idea of how steam is obtained.

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Electrical Progress.

THE *Moniteur Industriel* states that Capt. Exler, of the Austrian army, has found that a 16 C. P. incandescent lamp gives off a maximum temperature of 94° C., and a lamp of 25 C. P. 101° C. Two lamps placed in a woodeu receptacle yielded a temperature of 215° C., decomposing explosives such as gunpowder, ecrasite, pyroxyline, etc., but without exploding them. The receptacle having been filled with water, the latter became in a state of ebullition at the end of fifteen minutes. In case of the breakage of the lamps, the powder and pyroxyline do not ignite, but this is not the case if an explosive gaseous mixture is present. The captain points out that too many precautions cannot be taken, notwithstanding the use of electric lamps, which, while reducing the danger of an explosion, do not completely remove that danger. From the experiments made, it is held that the solution of the problem does not in any way lie in the employment of a double bulb with an intermediate closed space filled with air or water. The heating of the water would be avoided by the use of a reservoir having doublc communicatiou with the external euvelope, an arraugemcnt by which would be established a continuous current, and which would allow of the cooling of the water. But in order that the latter may be sufficient, the volume of water necessary would render the arrangement heavy and cumbersome, and the method is cousequently not practical. A ratioual solution for the lighting of places where gas or explosive materials are present seems to be, according to the captain, simply in arranging the incandescent lamp in a glass cylinder closed at both ends by means of metallic cloth; the current of air would freshen the bulb, and the slight heating of the air passing out would not be detrimental. In case of the breakage of the bulb, the combustion of the filament would produce at most only a small internal explosion, as in miners' lamps, incapable of transmitting fire outside.

THE electric candle is in great request in England for the lighting and decoration of dining and other tables. Au iugenious device for lighting the candles is provided by placing small pads under the table cloth, aud taking the current from them by means of two pin points in the base of the candlestick. The candles, of course, are extinguished on being taken from the table, and are relighted when they are replaced in the proper position. They are so arranged that the bulb and the glass imitation of a wax candle can be removed, when the caudlestick can be used for an ordiuary candle. Wheu used with shades of colored silk the electric candle makes one of the prettiest additions to a dinner table that it is possible to imagine.

THE trustees of the Los Angeles Consolidated Electric Railway Company, in compliance with a demand from the boudholders, will declare all of the $3,000,000 issue of bonds of the company now due and payable, but, as the company will not be able to pay them, the road will be sold by auction to the highest bidder to satisfy the bondholders. This will be the last step prior to the assumption of the ownership of the road by the Los Angeles Railway Compauy, the corporation formed by the majority of the bondholders last March to protect their interests and securc control of the road.

THE very hard steel used for the cyliuder wheel of ordinary watches is very apt to become highly magnetized when brought near dynamos running; and this magnetization, combined with the earth's magnetism, always causes the watch to get slow, and often to stop altogether. In order to annihilate this magnetization, a natural magnet or a powerful electro-magnet should be placed in a horizontal position—ou a table, for instance—and the watch held horizontally about half a yard off ou a level with the magnet. The watch must then be brought slowly nearer the magnet, while being turned slowly, and, at the same time, as regularly as possible, between the fingers, as on a vertical axis. When the poles of the maguets are reached, the turuing of the watch is to be continued, while being gradually withdrawn until the starting point is reached.

A NEW MATERIAL for conducting sound has been utilized by a Pittsburg firm, which advertises a telephone fitted with a receiver capable of transmitting speech perfectly with the operator eight or ten feet away from the 'phone. The diaphragm is made of aluminum and is exceedingly sensitive. This arrangement will enable operators to use the instrument without leaving their desks and will be a stride in advance of the present method.—Inventive age.

AFTER five years' work A. P. Crell, of Ionia, Mich., has invented an electric mail car which, he claims, will make the journey from New York to Chicago in five hours, or at the rate of 200 miles an hour. The car is made of steel and weighs forty tous. It is to run over an elevated track of steel throughout, eighteen feet from the ground aud supported by a cable. It souuds very impracticable.

A HOLLANDER has invented a process of sterilizing milk by subjecting it to the passage of an alternatiug electric current. All micro-organisms taken up by the milk from the air, etc., are permanently destroyed by the electric current. This germ-killiug quality of the electric current does not hurt the milk.

J. M. BLEYER, in an article iu the *Electrical Review*, argues that the true cause of death by electrification, as carried out by the prescribed laws of the State of New York, is due to "dynamic apoplexy"—another case of "heart failure."

THE first electrically driveu quartz battery in Australia was recently started to work at Hillgrove, New South Wales. The source of energy is six miles away, and the installation achieved a complete success.

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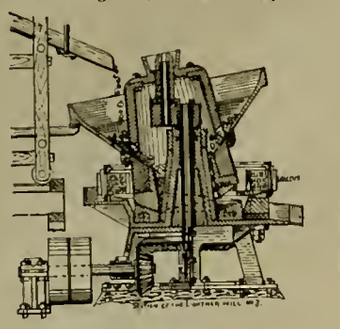

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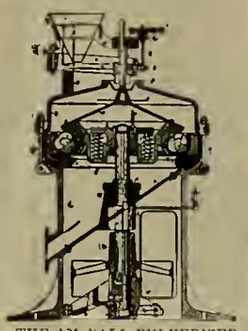

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GENERAL NOTES.—*Republican:* At the Zeila the entire works—miue, mill, chlorination works—are in full operation, giving employment to 100 men.

At the South Eureka a coutract is let to run 1200 feet of drift at the 1000-foot level, at $3.48 per foot.

MISCELLANEOUS.—F. A. Serine and R. K. McCoy have been operating the Anaconda quartz mine near Pine Grove for several months past. The claim appears to be of a pockety nature. A small crushing was made at the Levezzo mill, of surface rock, but it failed to pay expenses. This crushing was made merely to test the general character of the quartz. There is a streak of red clay met with in the claim resembling putty in its nature. A small ball of this was used as a candlestick. A few days ago one of the owners was working with his hands and felt something hard. Taking out the substance, he found it to be a nugget of gold worth between $4 and $5.

THE MECHANICS MINE.—The Mechanics mine will soon be opeued under the foremanship of George Taylor. T. D. Valentine of San Francisco has a hond on the property from Peter Fagan, the owner. It is located near Sutter Creek.

SOUTH EUREKA.—The South Eureka contractors are runuing the main drift from the 1050 level toward the rich body of ore which was encountered on the 900 level, a distance of 800 feet southeasterly from the main incline. It will take three months to tap the ledge.

Butte.

GENERAL NOTES.—*Times:* The Wright-Durgan miue on the Dogtown ridge is now running by the drift process and giving employment to fifteen men.

The old Ed Davis drift mino ou Dry creek is in operation and employs eight men.

Light & Mumford are ruuning their drift mine on Dry creek and employ four men.

Two loads of sulphuretted ore were sent down last week from the Gold Bank miue at Forbestown for shipment to San Fraucisco.

The Bellingsley hydraulic mine on Mountain House creek is ruuning steadily and giving work to six men.

Berry & Co.'s hydraulic mine on Mountain House creek now employs eight men and is paying well.

Grant's mine on Busb creek employs eight to ten men and pays well.

The Spring Valley quartz mine, near Oregon City, will resume operations in a short time. A San Francisco company has charge of it. Will Wilson is the superintendent.

The Matti mine, Green & Elliott proprietors, will resume operations next month.

The McNair mine, Frederick Bros. proprietors, will begin operations soon. This was always cousidered a rich mine, and now a tunnel will be run in 350 feet and probably a large force of men will be given work.

The mine ou the Hipps place will soon erect a five-stamp mill.

The Four Hills quartz mine, near Quincy, will resume operations soon.

At the Summit, or Perkins mine, the ten-stamp mill has heen run constantly all winter. The snow is now fifteen feet deep.

Calaveras.

THE ANGELS MINE.—*Echo:* The Angels mine, a few hundred yards north of the celebrated Utica mine, will be started up the 1st of June. It is owned by Coleman. Tarpey & Co. Electrical power will he used to run all the machinery at the mine.

THE LEONARD MINE.—A force of men have been put to work on the Leonard mine. The force is working in the tunnel and crosscutting to a new ledge on the east. Supt. Weymouth is very hopeful of striking a rich lead a little further eastward, as all indications point to such strike.

THE WOOD MINE.—The Wood mine at Robinson's Ferry has been bonded by a company who are pumping the water out preparatory to developing the property.

El Dorado.

GENERAL NOTES.—*Democrat:* The Avansino gravel mine at Pleasant valley has been closed down, and the machinery used in sinking removed. The channel was reached at a depth of 100 feet, but the gravel found would not justify further development, hence the suspension.

Operations at the Lone Star mine, above Smith's Flat, have beeu temporarily suspended, pending the construction of a cylindrical revolving crusher, which is to take the place of the arrastra formerly used.

The Transcendent mine, one mile west of the Taylor, is a new mine. The ore is impregnated with sulphurets, but prospects well in fine gold. It is thought to be good for at least $10 per ton in free gold. They have out about 200 tons of ore, and will soon make a mill test at the Defiance mill.

Work is being done on the Collins mine, with good prospects.

The Emma mine is being worked as usual, and some good pockets are being taken out.

Humboldt.

ORLEANS BAR.—*Eel River Advance:* Maurice Vivier returned to Fortuna from Orleans Bar, where he had been prospecting for two or three weeks, and he brought back glowing accounts of that mining section. It is his opinion that $2.50 to $3 a day per man can be made in those "diggin's," and it is his intention to return to that place to further investigate mining possibilities, with the view of enlisting capital to take hold in that section which in times past has been one of the richest placer mining districts in the State, and with improved mining apparatus it would yet yield a large amount of gold.

Kern.

LOWER GOLER.—James and Stevens have made an average of $50 per day and Kuffle and Swartout an average of $15 a day for the past week taking gold dust out of their claims.

The Benson brothers are putting a plaut on their mining claim, and it will be in operation in a few days. They have taken out of the ground over $40,000 in the past two years. Mr. Ellison is doing equally as well.

There are several good quartz miues reported in Jawbone canyon about twenty-five miles from the Sixteen-mile house. A ten-stamp mill is being put in on one of the claims.

AMALIE DISTRICT.

Since the discovery of the new ledge in the Amalie miue, reported in the last issue, every available bit of ground in the district has been located.

Nevada.

THE NATIONAL MINE.—*Union:* The National mine at Grauiteville has been pumped clear of water and operatious will be resumed next week.

THE NORAMBAGUA.—*Tidings:* The Norambagua mine is opeued up and the several parties who are workiug it will have their ore crushed at the Perrin mill. Some of the ore has already been crushed hut the roads have been so soft that hauliug has been postponed. About one hundred loads of ore will be put through the mill and it is expected that the work of crushiug will be resumed next week.

THE ROSE HILL.—*Tidings:* The Rose Hill machinery is now ready for operation. The engine is a six-horse power gasoline machine, and cost, laid down in Grass Valley, $635. The stamps are three in number, weigh 850 pounds, and at average speed will drop eighty times per minute. This three-stamp battery cost, material and all, $815. This price includes a self-feeder. It is expected that twelve tons of ore can be crushed each twenty-four hours. It required less than a week to set up the engine and put the stamps in position after the arrival of the machinery, though some preliminary work has been done in framing timbers. The building to contain the machinery cost $800, making the total cost of the entire plant about $2250. The engine will consume 1¼ gallons of gasoline per hour, the cost of which is twelve cents per gallon when purchased in bulk. Thus the cost for power will be from eighteen to twenty cents per hour or between $4 and $5 per day.

The mine at present has no concentrator for saving sulphurets, the ore being mainly free gold ore. If, however, it be found necessary, a concentrator can be added.

J. M. Wishart, the superintendent, with his force of fifteen or twenty men, is taking out ore.

WASHINGTON DISTRICT.—*Herald:* An increased force of men has been put on at the Spanish miue preparatory to putting up the new mill. Fred Bradley is overseeing the work.

Henry Phillips, superintendent of the Mountain View and other adjoining mines, came up Friday from San Francisco on his way to the mine. He brought up a quantity of supplies for the mine, among them a Joues' patent rock drill which he will immediately set up. Some San Francisco parties accompanied Mr. Phillips, who will inspect several of the ledges in this vicinity and make tests of the ore.

Messrs. Boulanger and Haskell, of San Francisco, are in town inspecting the St. Patrick mine.

Messrs. Hall, Geiser, Miller and Rourke are here to examine the Arctic and other property in the vicinity of Canyon creek.

The mill at Blue Jay mine is runniug. The owners have some fine rock on the dump, which they are putting through.

Thirty stamps are kept constantly dropping at the Oak Tree mine, and a full force of men are at work taking out ore.

GOLD BAR AND GOLD POINT.—*Transcript:* A steam plant is being put up at the Gold Bar mine. Good prospects are reported and drifting will be commenced soon.

The ten-stamp mill at the Gold Point mine began crushing again Monday. Rock enough to keep it running some time is now on the dump.

Placer.

THE MARGUERITE.—The Marguerite mine has not shut down. The men who had the contract to sink the sbaft a certain number of feet have given it up and a new contract has been let to other parties.

THE BOULDER MINE.—*Republican:* The employees of the Boulder mine, of Ophir, which closed dowu last week, were informed by Superintendent Brown that they would be paid off last Saturday. Saturday came, and with it the meu for their pay, but alas, it never materialized. It was later ascertained, so we are informed, that the money for the bullion, which had been shipped to the mint at San Francisco, was expected to arrive at Ophir Saturday morning but it had been headed off at Sacramento by the Superintendent. The men are very anxious of his whereabouts which is at present unknowu. The loss of the money is a great blow to the little mining town of Ophir, as the stores there had giveu the men time on their purchases knowing that the money was due them. The miners, about twenty in number, have lost on an average, $100 each, but, undaunted by this severe loss, they have taken the mine themselves and propose to work it until every dollar is paid up. The ore is very good in the mine and they will probably not lose in the end.

A RICH STRIKE.—*Argus:* A rich strike was made at the Marguerite, near town, Tuesday morning. They are down over 300 feet and have had fine prospects all along, but on Tuesday they struck a five-foot ledge of some of the prettiest ore we have seen. It will go $60 to the ton.

San Diego.

JULIAN DISTRICT.—The Ready Relief Miuing Company has let a contract for sinking a 100-foot shaft on the Redman mine. It is theu intended to run a drift under the creek, connecting with the Ready Relief mine. The pump and hoisting machinery in the Redman is in place and in working operation, being run by water power from the Ready Relief plant.

IN THE CHOCOLATE MOUNTAINS.—Two gold mines have been sold in the extreme eastern part of the county in the Chocolate Mountain range by L. E. Auhury of San Diego to Kansas City men, who are credited with an intention to pump water from the Colorado river and build a five-stamp mill.

Sierra.

FROM SIERRA CITY.—At the Bonanza mine, over forty men have been thrown out of employmont, owing to the stopping of that mine, owing to temporary disagreement among the owners.

After a run of twenty-eight days, the Butte Saddle made a clean-up of $6000. The company have a ten-stamp mill, but for several days past they have only run five stamps.

The Sierra Buttes pays a monthly dividend to its owners. A few days ago they discovered another rich ledge in the mine.

Trinity.

RICH RETURNS.—The mines of Trinity county are yielding rich returns this year. Many new quartz mines are being opened, and the yield of gold from that county bids fair to exceed the largest amouut taken from that county in receut years.

Ellery Bros.—Elias and James—have a bonanza in quartz near French Gulch, according to reports. They have already cleaned up a small fortune from only two runs.

A French Gulch syndicate are the reported purchasers of the Jack Strode mine at Trinity Center. This mine shows a fine lot of ore chutes, milling from $50 to $100 per ton.

Tuolumne.

GENERAL NOTES.—The Mammoth miue is being vigorously opened by Wm. Johns. Two tunnels are being run with excellent prospects. The lowest will connect with the mill, which will be built as soon as lumber can be secured for its erection. Forty stamps will be set, to be supplemental, as soon as the mine's development warrants an increase to sixty stamps.

Rich ore is being taken from the Jumper mine, from both levels north and south. The mill is ruuning day aud night. The ore is improving as developments proceed. The ore body is very extensive, needing a larger mill.

The Golden Rule mine, north of the Jumper, is in the same black metallic slate formation. It is being developed, and its former record is now verified by the present rich finds.

The Miller & Holmes Consolidated Co. comprises the Gray Eagle, Nyman and Knox & Boyle, all situated south of the App mine, Quartz mountain. Work is being vigorously carried on in these shafts simultaneously. Ore of a good quality is being extracted. This company is putting in an electric plant, power derived from Wood's creek.

NEVADA.

ESMERALDA CO.

A BIG STORY.—J. A. Yerington who has a bond on the Hard Scrabble mine in Silver Star district gives the Salt Lake *Tribune* a big statement about it. He says 6000 tons are now in sight, and the ore is supposed to run from $90 to $100 per ton in gold, and after it had been opened up to a depth of 165 feet and a ten-foot vein had been developed, assays were obtained from the full face giving a value of $163 in gold.

The district lies at an altitude of 7000 feet, and until August, 1892, was unknown as a gold camp. Prior to that time, it had been a moderate silver district, but the demonetization of that metal rendered the mine worthless, and the camp was abandoned. It was on the edge of a mule trail that the first signs of gold ore were discovered, and on this discovery the Hard Scrabble location was made.

"The ore has paid from the grass roots down and in the first surface workings, 118 tons of ore milled out over $10,000 in a crude stamp mill that had been hastily constructed.

"Many experts have visited the district, among others Professor Potter of St. Louis and Governor Colcord, and the unanimous opinion is that the mother lode has been discovered between the Excelsoir and Santa Fe ranges of the Sierra Nevadas. The vein appears to be continuous, and the only interruption yet found are lateral seams of oxidized silver ores."

PROSPECTING ACTIVE.—Prospecting is very active in the several gold camps of Esmeralda county. New finds continue to be reported at Silver Star, and some of these are very rich. For a while it was thought that the first locators had got all the rich veins, but a recent find shows that in mining, as in all else, there are "as good fish in the sea as ever have been caught." In the West it was said of rattlesnakes, "When there is one always look for two," and it is about the same as regards mineral veins. Where one big, rich gold vein has been found other good veins are pretty sure to exist. A good indication of the value of the several Esmeralda gold camps is that one finds nobody coming back from any one of them. It is better to live fat on a four-inch gold vein than to go hungry on a forty-foot silver lode.

HUMBOLDT CO.

THE KENNEDY GOLD MINES.—*Journal:* Kennedy has merit and will prove its worth, though laboriug under great disadvantages. The mines were discovered by poor men when the mining business was at low ebb in Nevada. The discoverers shipped a few tons of selected ore to the Reno Reduction Works from which they realized a few thousand dollars, which they expended in developments. A year ago some of the most promising mines in the district were bonded to an adventurer. A quartz mill built in Chicago many years ago was removed from another district to Kennedy. The process of amalgamation, which was the simplest known, was not adapted to the ores of Kennedy; the adventurer left, leaving only his creditors to regret his departure, and the rich district was given what in mining parlance is termed a "black eye." The mine owners, all of whom, as is usually the case in new districts, are poor men who are working energetically to develop their properties, but without money or credit they find it up-hill business. Ores are being selected from the richest of the mines for shipment to the Selby Smelting Works in California. This involves an average outlay of about $30 per ton. It is seldom, even in the best paying gold miues, that ores can be found in quantity that will average that amount, hence Kennedy cannot be prosperous until works are erected on the ground that will treat the ores successfully. The general opinion of mining men is that there is abundance of gold-bearing ores in the district, and that all is required to make it one of the most productive aud prosperous in the country is bome works for the reduction of the ores, at a cost of $15 to $20 per ton. That such works will be erected in the near future cannot be doubted, and when they are Kennedy will be a lively camp.

NYE CO.

AROUND GRANTSVILLE. — Thos. Mitchell, agent for F. C. Nichols of Bridgeport, Conn., has sold the Ellsworth ten-stamp quartz mill to Theo. Cirac of Grantsville, who will move it to Union Canyon to work his gold ore from the North Belle mine.

T. J. Bell, in his placer mines back of lone, is turning out $100 every four days.

ARIZONA.

SILVER BELL.—There are sixty men working on the Silver Bell under Superintendent R. Hamilton, who also has charge of the smelter at Tucson.

REPORTED RICH.—*Journal-Miner:* There is considerable excitement over recent strikes in the mountains between Thumb Butto and Copper Basin, and a dozen or more locations have already been made in that vicinity. The ore near the surface is fabulously rich in gold. The new finds are located within six to eight miles of Prescott.

COLORADO.

AT FLORENCE.—*Record:* The cyanide plant at Florence has commenced operations. The full capacity is 100 tons per day.

INCORPORATED AT VICTOR.—The Fairview Gold Mining and Milling Company is incorporated with a capital stock of $1,000,000, to operate at Victor. The incorporators are S. B. Smith, J. H. Purnell, P. W. Harrington, J. Hastings and A. V. Purnell.

LEADVILLE.

TWO SILVER STRIKES.—While the gold properties have been attracting so much attention during the past few months, the silver properties have not been idle, and in addition to the regular shipments of iron and silver ore, much important development work has been carried on which is now resulting in some very excellent new discoveries. The latlest strike is that made by the Northern Mining company in the Capital shaft. This shaft was worked for a long time by the Carleton Brothers and a few months ago they found it necessary on account of the depth they had to go, and also the large amount of water they had to handle, to form a mining company. This was done and was known as the Northern, and in which some of the leading mining men of the camp are interested. Much important work has been done since that time, and some good ore encountered, but the biggest strike was made yesterday. In one of the drifts run out a body of chlorides of the richest kiud has been eucountered. The assays from this ore are something immense. The general average of the ore that is uncovered is about 800 ounces in silver to the ton, while some of it runs away up into the thousands. Of course, at present it is impossible to say the extent of this strike, but the management believe they have a good ore body. At any rate the chlorides that they cut into are the finest seen in the camp for many a day.

Another important silver property that has forged to the front is the Bohn shaft. The streak of ore which Major Bohn was following has gradually opened out and bas run into an ore body. The actual extent of the chute is not known, but so far as is proved up it is at least fifty feet wide. The breast is very valuable, as assays show the lowest grade has not less than fifty ounces in siver, while some of the first-class shipping ore runs as high as 700 ounces. The shaft is already on a paying basis and promises to develop into something very rich.

HINSDALE CO.

THE GOLDEN FLEECE.—Lake City *Phonograph:* The output of the Golden Fleece last month amounted to over $39,000. The company is working a force of about seventy-five men, but only twenty-five men are employed in taking out ore for shipment, the rest being engaged in development work. The regular two per cent. dividend was paid by the company last Monday, which amounted to $12,000.

IDAHO.

AT SILVER CITY.—The Black Jack is running along as usual, milling about twenty-three tous of ore daily. Sixty-five men are employed. The Idaho tunnel is in 2000 feet. Between 100 and 150 feet is yet to drive before striking the ledge. Eight shifts with power drills are working in the solid granite, but good headway is being made.

A WALLACE dispatch of the 7th says: Operations at the Hunter mine at Mullen were abruptly terminated last night. Yesterday President Henry of the Miners' Union went

to Mullon and advised Martin Curran, the superintendent, that if he did not raise the wages to the Canyon Creek scale or quit work the Union of Canyon Creek would be over there several hundred strong, and they would run him out of the country and possibly kill him, and that the mill would probably be blown to pieces. Superintendent Curran wired to Dennis Ryan, one of the principal owners, living at St. Paul, as follows:

"Compelled to quit or take chances of having the mill blown up and myself run out of the country. Answer."

The reply came to close up the mine and mill. Consequently, the men were discharged last night and paid off this morning. The mine has been in operation only a week.

THE BUNKER HILL AND SULLIVAN.—A Wardner dispatch of the 8th says: The Bunker Hill and Sullivan management, having expressed a willingness to resume work in their mine at $3 for miners and $2.50 for shovellers, the business men of Wardoer and Kellogg drew up this petition, which is being generally signed:

"We, the undersigned, citizens of Wardner and Kellogg, in consideration of the extremely low price of lead and silver, and in further consideration of the fact that the cost of living has decreased, believe that while these low prices continue $3 per day for miners and $2.50 for day laborers are fair and just rates of wages.

"We further believe that the Bunker Hill and Sullivan Mining and Concentrating Company has the same right to manage their own affairs as we have to manage ours. We hereby pledge the company our cordial support in its determination to pay no higher wages while prices of lead and silver are so low, it being understood that the said company will restore wages to the former basis of $3.50 and $3 whenever the prices of lead and silver advance so that the combined value in New York of 100 pounds of lead to 2½ ounces of silver shall amount to $6."

It is believed the mine will resume on this basis. About 400 men are employed.

NEW MEXICO.

RESUMED OPERATIONS.—The New Mexico and Arizona Smelting Company's smelter at Ivanhoe is working. While it was undergoing repairs the company operated its properties. Hundreds of tons of ore are now on the ground ready for treatment. The smelter has been relined and is reported in better condition than before the shut-down.

A MINING DEAL.—An Albuquerque dispatch reports that the sale of a one-fourth interest in the Crown Point mine, one of the best properties in the Cochiti mining district, was consummated this week, $10,000 being the price paid. The Crown Point is a paying mine, and several carloads of ore shipped to the smelters carry over $200 in gold to the ton.

OREGON.

BAKER CO.

A PROSPEROUS REGION.—There are few idle men around Baker City. All along the line, from Baker into Sumpter valley, there are evidences of prosperity in the various mining fields. Every little creek seems to be a stream of mud, instead of water. They have discharged all the Chinese, and Americans are taking charge of the placer fields that Celestials formerly had exclusive possession of. The appreciation of gold is warranting miners in venturing on little veins which do not exceed from four to six inches in thickness.

The Pix mine, lately sold for $35,000 cash to a New York company, is employing a large crew of men. They are working the mine by shaft and the vein is small. It does not exceed ten inches, yet it is rich in gold.

The Bonanza has lately become the chief rival of the Virtue. With ten stamps running full blast, it has taken out $26,000. It is in a mineral zone, with no walls, or any evidence of such. The vein is from four to six feet thick, and is averaging about $50 to the ton. Mr. Geiser, the manager, is now sinking a double shaft, 480 feet in depth, that will be four feet wide in the clear by eight feet wide.

The Cable mine, formerly known as the La Belle, has been employing a large crew of men the entire winter.

The Phœnix, lately purchased by the same New York company that purchased the Pix, is also a gold producer. There is little being accomplished in placers, for there is less snow than for more than thirty years, and it is only gradually melting away, the soil absorbing the moisture completely before it reaches the ditches.

JACKSON CO.

THE QUINE MINE.—The placer mining and milling plant which will work the Quine mine at Riddle consists of two boilers of 35-horse power and a pump with a 12-inch suction and a 10-inch discharge, with a capacity of 2000 gallons per minute.

GOLDEN STANDARD.—H. D. Kuhli writes from Gall's Creek district that a richer body of ore than ever has been struck in the Golden Standard mine. He says that as high as $2 has been obtained from a handful of it, and enthusiastically adds that he is now asking $50,000 for the mine.

WASHINGTON.

THE CONCONULLY COUNTRY.—The Bridgeport Mining & Milling Company intend to resume development operations on their Mineral Hill property. Last season they spent $20,000. They have a fifty-horse power boiler, a forty-horse power or five-drill capacity air compressor, a hoisting engine and pump—the latter with a capacity of 3000 gallons per hour—two drills, and a sawmill of 5000 feet per day capacity. Where the plant is located, and which point it is proposed to make the base of operations in the development of the entire group of mines, there is now a 100-foot shaft which is to be sunk 200 feet deeper, and they will run drifts and crosscuts to open up the different leads and ore bodies. There is a body of ore where the shaft is being sunk and another about 500 feet farther north, as well as several parallel veins which it is proposed to prospect and develop from the 300-foot level of the present workings. The ore averages about sixty ounces in silver and $10 in gold per ton, and carries 15% lead. The company is composed of New England people, mostly from Bridgeport, Connecticut.

CANADA.

RAINY LAKE ATTRACTING ATTENTION.—"A gold fever unprecedented in Canadian history" is reported in what is known as the Rainy Lake region of Ontario, in the wild and almost inaccessible territory that is best reached either from Port Arthur or from the mining lands on the Minnesota side of the lake. There is now probably 2500 men in a small district, where, with the exception of Indians, not a man was to be found a year ago. A dispatch from Quebec says: "The miners are pushing in rapidly, coming from all parts of the world."

BRITISH COLUMBIA.

A GENERAL STATEMENT.—Miners are scattered all over the interior of British Columbia, and the gravel along the rivers and streams in the province is being raked by a roving army of several hundred men.

There is some stir at Rossland, the latest boom town of British Columbia. Harry Baldwin made a discovery of gold quartz a few miles from Rossland which assayed $22 to the ton and the whole town went wild. There was a stampede in the direction of the find. All came back disappointed, for no other discoveries of any great importance in that section have been made.

The Trail Creek country is said to be a good place to keep away from. The country is overrun and expenses are heavy.

GENERAL MINING NEWS.—About 150 men are working the placers on Carihoo creek.

One monitor is working on Forty-Nine creek, near Nelson.

Up to April 17th, 2,337 tons of ore went through Nakusp from Slocan.

With silver at 60 cents it is estimated that the Slocan Star shows $2,000,000 worth of ore.

Col. Peyton, of the Le Roi Mining Company, has booded the Wagner group, Lardo, for $15,000.

The Hall Mines Company is figuring on the cost of a smelter at Nelson; seventy men are working at the mine.

The Mollie Hughes is the last Slocan shipping mine. A small quantity was sent to the Pilot Bay smelter.

The Robert E. Lee and Maid of Erin, at the Forks of Trail creek, show a vein of ore 15 feet thick, running $10 to $16 to the ton.

The Revelstoke smelter property has been purchased by a Chicago firm.

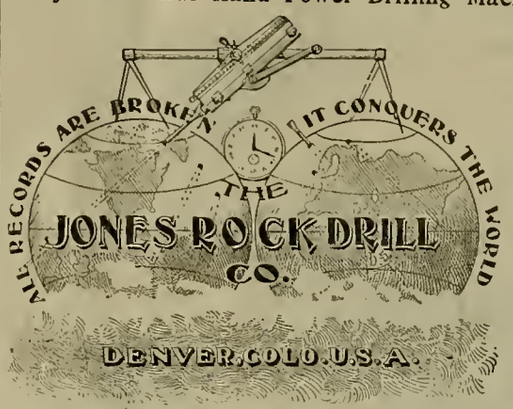
Messrs. Carter & Clarke have had refunded them $934 10, duty paid on a concentrating plant a year ago.

The Noble Five, Slocan, has remained in the hands of the original locators. They have shipped 1,050 tons of ore, which paid every dollar expended on the mine.

News comes of prospecting and assessment work going on in Boundary creek and Midway districts. The shaft on the Last Chance is to be deepened. The four foot vein widens the deeper it is followed.

James Breen, representing smelter companies of Butte, Mont., has been in Nelson. He says that if Nelson can show that ore can be smelted there cheaper than on the American side, the smelter will go up there without any bonus.

THE JONES ROCK DRILL
IS THE
Only Successful Hand Power Drilling Machine Ever Invented.



It is strong, durable, reliable, simple, compact, light, easily handled and operated by one man, and will reduce the cost of rock drilling at least Fifty per cent.

Our handsomely illustrated pocket catalogue fully explains the features and workings of the drill. It should be in the hands of every mine owner, leaser, contractor and prospector in the West. *Sent free on application.*

If you are interested in Rock Drilling Correspond with us.

WE CAN SAVE YOU MONEY.

FRANK T. SUTHERLAND, M'g'r Pacific Coast Agency.

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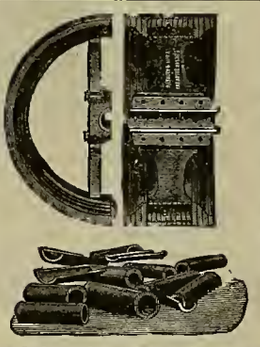

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Is the lightest, strongest and most convenient Pulley made.

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SIMONDS SAW CO.,
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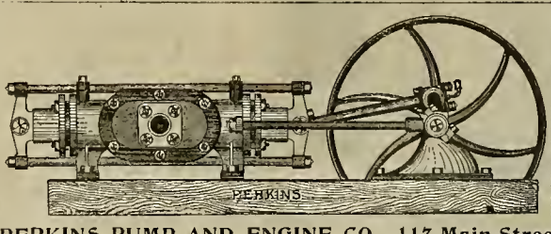

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Perkins Double-Acting
PLUNGER PUMPS.
Capacity 2000 to 20,000 gals. per hour. Especially adapted for mines. Will raise water any height or distance and can be worked successfully under every possible situation. Pumps sand and water. No cylinder or piston to wear out. For all particulars send to the
PERKINS PUMP AND ENGINE CO., 117 Main Street, San Francisco.

PATENT HOOP CLAMP.
ALL SIZES.

MALLEABLE IRON HEADS, WROUGHT IRON BOLT.

These Couplings are the Best in the World, Most Powerful, and Convenient. Work freely, having a direct pull with right and left screw, acting on a Ball and Socket Joint. We use them extensively in our Tank Building Department.

ORE VATS,
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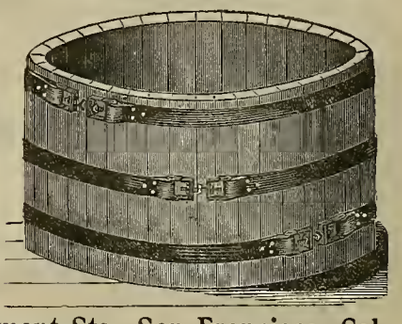
STAMP GUIDES,
—AND—
WATER TANKS OF ALL SIZES.



WELLS, RUSSELL & CO., MECHANICS' MILLS, Cor. Mission and Fremont Sts., San Francisco, Cal.

Oil Fuel for Locomotives.

President G. B. Leighton, of the Los Angeles Termiual Railway, states that a Baldwin eight-wheel passenger engiue has been changed from coal to oil burning, with the Holden burner. This burner, roughly speaking, cousists of three concentric tubes, the oil passing through the annular space between the outer and middle tubes and steam from the boiler passing through the like space between the inner and middle tubes (the inner tube carrying air). the steam and oil pass into and through one combining tnbe, from which they arc discharged through two small holes in the end, forming two jets for each burner, one straight ahead and one at such an angle with the axis of the burner that it meets the corresponding jet from the other burner about the center of. the fire-box, the four jets there flaring ont and forming a sheet of flame which fills the box horizontally, and impinging against the front brick wall, follows back nnder the brick arch and then up over it into the flues. A more iutense heat is obtained than with coal, but is so evenly distributed that no objectionable local heating takes place. The bricks iu the box become white hot, and retain their heat so that the engine will stand all night (ten to twelve hours) with dampers and smokestack closed, and retain a pressure of twenty to thirty pounds of steam in the morning. The oil feed is regulated separately iu each burner. One is arraiiged so that a quarter turn of the wheel shnts off the oil, and the other reqnires several turns. Thus one buruer may be shnt off simultaneonsly with the closing of the throttle, and the other, which is left burning during stops as well as when rnnniug, is used, by virtne of its gradual feed, to nicely adjnst the snpply of oil to the demand, as iudicated by the smokestack and steam gauge.

The grate snrface is floored over with brick, except a triangular space twenty-four inches long by eighteeu inches wide, through which air is admitted. The brick arch is longer than in ordinary practice, and by the proper adjnstment of this arch and the grate opening, preventing the incoming cold air from striking against the exposed parts of the sheets, no trouble need be had with leaks, resulting from undne contraction wheu the oil is temporarily shut off or tnrned down, and there is no indication that boiler repairs will be materially increased.

The oil tank is built to fit in the coal space of the tender, and holds a snpply of twenty-three and one-qnarter barrels of oil (eqnivalent to abont seven tons of coal), the oil beiug heated by a coil of steam pipes in the bottom of the tank, as more satisfactory working is obtained when the oil is thinly finid. Au air pressnre of five to seven pounds per sqnare inch is carried in the tank, this aud the heating device being especially necessary in the use of heavy oils. The wire netting and baffle plate are removed from the front end and the nozzles redneed to three inches.

The engine has been heretofore rnnning in light passenger service between Los Angeles aud San Pedro, twenty-seven miles, burning Welliugton coal costing $7.50 per ton on the coaling track. During experiments extending over a period of two weeks prior to the change, a precisely similar engine, in esseutially the same condition and the same service, evaporated 6.2 pouuds of water per pouud of coal, from feed water at 60° F., to steam at 150 pounds pressure—366° F. Since the change they have burned two different oils; the first, a Santa Paula oil of 24° to 28° Baume, gave an evaporation of from 11.73 pounds to 12.40 pounds of water per pound of oil, these being the extreme limits. The least favorable of these limits makes 3.3 barrels of oil, costing $4.19, equivalent to a ton of coal, costing $7.50—a saving of 44.1 per cent, while the most favorable gives a saving of 47.2 per cent. The above is fignred at $1.27 per barrel for oil.

The other oil is a Los Angeles product of from 13.8° to 16° Baume, which costs seventy-five ceuts per barrel and which has given an evaporation of 10.31 pounds of water per pouud of oil, which, figured as before, gives a saving of 64.2 per cent.

The approximate accuracy of the above is checked as follows: During runs covering a total of 1094 miles with Los Augeles oil, the cost per mile for fnel has been 11.1 cents, as against an average for the previous year of 28.3 cents for coal. This shows a saving of 60.8 per ceut. The difference between these two results may be accouuted for by the fact that in the coal-burning service the engine was allowed a slight switching mileage, aud in the oil service none has beeu allowed, and also in oil buruing a small percentage of the steam generated is used in the burner aud in the steam pipes for heatiug the oil, this making a slight increase in cost per mile for fuel that the evaporatiou comparisou would not show. Where an engine is worked hard, with heavy trains or at high grades, and the waste of coal correspondingly enormous, a still greater saving may of course be had, as combustion of oil is virtually complete however hard the engine may be forced.

The Useful Donkey.

It seems, says the *Scientific American*, that Mr. Shepherd has a very rich mine in an almost inaccessible part of the Mexican mountain ranges, a long way removed from any railroad, which he has been equipping at great cost with first-class mechanical appliances. Some time ago Mr. Shepherd concluded that his equipment required 5000 or 6000 feet of wire rope for carrier purposes, but how to get it up into his mountain fastness in a single piece, as required. was a question. By no possibility could it be moved from the railroad to final destination on wheels, and he didn't see how it could be carried by burros. But a Mexican did it. He explained his plan, got the contract for carrying the 1¼-inch cable, and successfully executed it. Here is the way he did it: He coiled the rope up at fixed distances along its entire length, each coil being of approximately the same size aud designed to weigh 300 pounds, and loaded it on a string of burros with proper fastenings. To take up the slack between each two burros, two Mexicans with padded shoulders were inserted and faithfully kept up their end, or rather portion, of the line. The processiou was a curious one, to be sure, but it got there just the same.

THE WILSON

HIGH GRADE STEEL

SHOES

—AND—

DIES.

Guaranteed to Wear Longer and Prove Cheaper than any others.

Made by use of Special Appliances.

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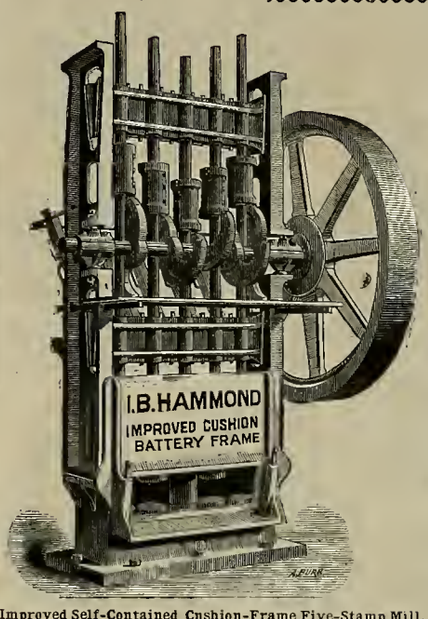

Improved Self-Contained Cushion-Frame Five-Stamp Mill.

The Improved, Iron-Frame, Self-Contained, Cushion - Frame, Five - Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The Term "Self-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

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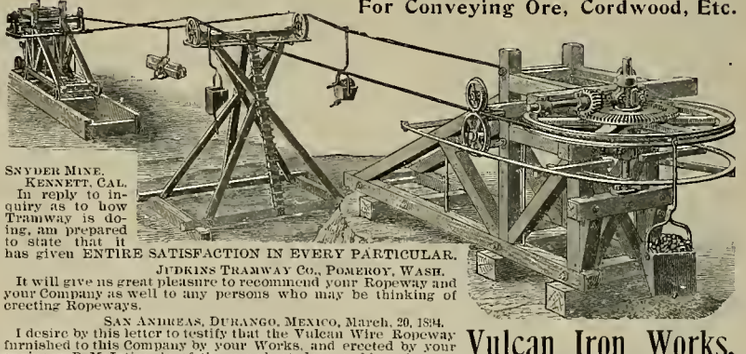
VULCAN WIRE ROPEWAY

For Conveying Ore, Cordwood, Etc.



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In reply to inquiry as to how Tramway is doing, am prepared to state that it has given ENTIRE SATISFACTION IN EVERY PARTICULAR.
JUDKINS TRAMWAY CO., POMEROY, WASH.

It will give us great pleasure to recommend your Ropeway and your Company as well to any persons who may be thinking of erecting Ropeways.
SAN ANDREAS, DURANGO, MEXICO, March, 20, 1894.

I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation.
ANTONIO H. PAREDES, Director S. A. de la S. M. Co.

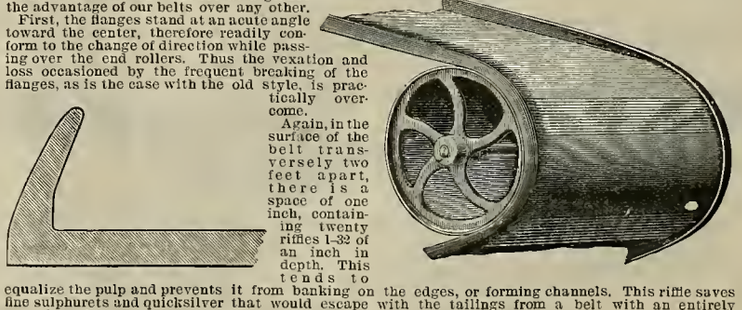
Vulcan Iron Works,
135-145 Fremont St., San Francisco.

Blasdel Improved Concentrating Belt.

We keep in stock belts suitable for the Frue, Triumph, Johnston and Tullock machines, and make all lengths and widths to order.

Practical mill men must see at a glance the advantage of our belts over any other.

First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.



Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty rifles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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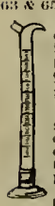

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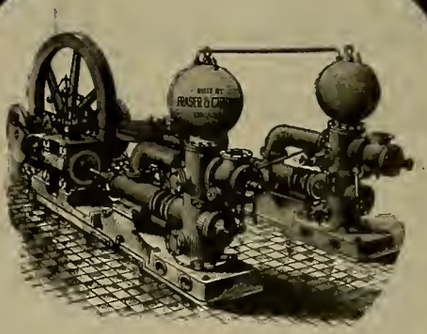

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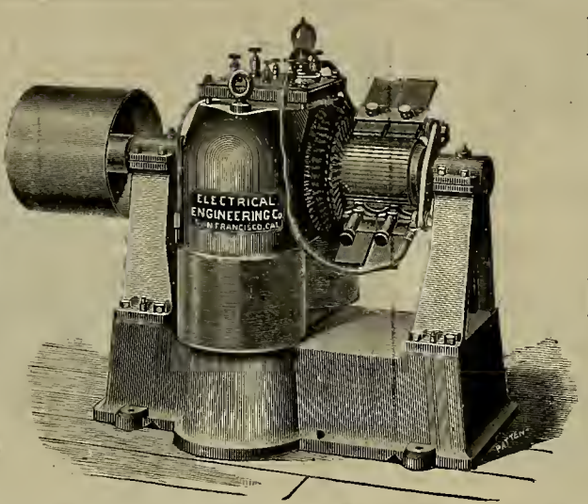

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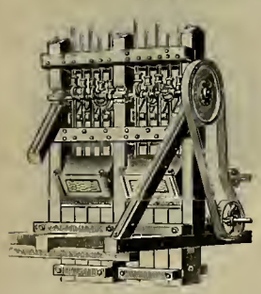

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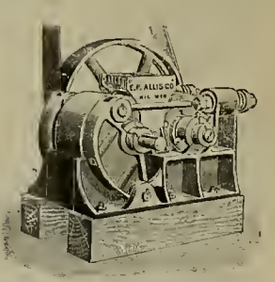

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IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.
AT REDUCED PRICES.
Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.
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BATTERY SCREENS AND WIRE CLOTH.
—AGENT FOR—
Hoskins' Hydro-Carbon Assay Furnaces.

Market Reports.

The Markets.

SAN FRANCISCO, May 9, 1895.

There is little of change to note in any of the metal markets or product prices during the week. The silver "market" is rising to the dignity of a national political topic and will dominate all issues in the coming party campaign. Copper has appreciated a few points in price; lead, at brokers' quotations, remains below the three-cent level.

New York Metal Market.

NEW YORK, May 9. — PIG IRON—Scotch, 19@20c; American, 9.50@12.00c.

COPPER—Brokers', 9.75c; exchange, 9.85c.

LEAD—Brokers', $2.95; exchange, $3.07½.

TIN—Straits, 14.35@14.45c.

SPELTER—Domestic, $3.20.

New York Silver Prices.

NEW YORK, May 9.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30¼	66½	9 75	
Saturday	30⅜	66¾	9 75	3 07½
Monday	30⅜	66¾	.....	.....
Tuesday	30⅜	66½	.....	.....
Wednesday	30⅝	67	9 75	3 07½
Thursday	30¾	67½	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	5c
New York Telegraphic Transfer	7½c
London Bankers' 60 days	$4.88¼
London Merchants	$4.86
London Sight Bankers	$4.89¾
Refined Silver, per ounce	67¼c
Mexican Dollars, nominal	54@54½

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt, ¼ & 5-16, 17c; ⅜ and larger, 16c			
Lake Superior Sheathing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17
TIN PLATE.			
Per box	5 25	@	6 00
PIG TIN.			
Per lb	15	@	16 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do. "		"	1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARN—PER TON.			
Wellington			$ 8 00
Greta			7 75
Nanaimo			6 50
Gilman			6 00
Seattle			6 25
Coos Bay			5 50
Cannel			10 50
Egg, hard			12 50
Wallsend			7 50
Scotch Splint			7 50
Brymbo			7 50
West Hartley			8 75
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	15 00	@	— —
Cumberland	11 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'			75c ₩ bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	18 00	@	18 00
Spruce	25 00	@	30 00
NAILS.			
Wire			$1 75
Cut			1 55
ZINC.			
Sheet	8¼@		

Mining Share Market.

SAN FRANCISCO, May 9, 1895.

Everything in the shape of mining stock slumped during the week, whether because of encouraging reports from the mines or in spite of such news, being as much a matter of opinion as of fact. Even Hale & Norcross, which has been huoyed up by expectation of the long-delayed decision, shared in the general droop. The weak and weary character of the daily transactions in the San Francisco Stock Exchange contrast sharply and strangely with the stir in nearly every other mining stock exchange. In all other cities there is a general advance; here there is a general decline. Though the working of the mines and the working of the street are not generally supposed to have much in common, yet it is believed that the recent control of the Sutro tunnel hy a new company credited with some enterprise, could he the cause of co-operation and mutual profit.

The new owners of the Sutro tunnel are said to have almost unlimited capital. They should push an exploring drift out into the section of country lying immediately west of the Comstock. While immense sums of money have heen expended in exploring the country north and south on the line of the lode, hut little has been done to the westward except the surface scratching of the pioneers in the early days. The "west country" contains many lodes that crop holdly above the surface. Some of these are immense, and all show more or less well in the precious metals —mostly in gold—at the surface. This ground hack of the west wall of the Comstock was very wet in the early days. The shafts sunk by the prospectors who made locations on the veins of that section soon encountered water. Then short drain tunnels were run. As few of these tapped the veins for which they were run at a greater depth than from fifty to eighty feet, they were of little use, further than that some of them furnished a supply of water for use in the town for a time. For over thirty years all this region of unexplored country has lain as left hy the pioneers. Now it may he easily and cheaply drained and prospected to an immense depth hy running a drift into it from the Sutro tunnel. The old owners of the Sutro tunnel were always talking of exploring this region, hut all ended in talk. It is the very biggest thing in sight for the new company. The running of an exploring drift would not interfere in the least with the working of low-grade deposits at the front of the lode. The veins of the "west country" are supposed to he gold-hearing, as gold predominates in the croppings. If so, they can undoubtedly he made to pay, as such ores may he cheaply concentrated if found to he of low grade. From the croppings of one of the veins, the Cole, several hundred thousand dollars in gold was taken at a time when mining, milling and all else was very costly. To open up the "west country" would he to give the Comstock a new lease of life. In running a tunnel west there would also he a chance of finding rich veins that do not show on the surface.

The Justice Mining Company re-elected the old management—August Waterman president, R. E. Kelly secretary, R. P. Keating superintendent.

Shipping Con. Cal. and Va. ore to the Morgan mill for reduction was resumed during the week.

Mining assessments falling delinquent this month amount to $101,020; California miues ask for $11,700 and Nevada mines $89,320.

A statement of the cash halances of the following mining companies on the first Monday of May is appended:

BONIE MINES.		East Sierra Nev.	$134
Bodie	$ 6,239	Exchequer	2,299
Bulwer	4,026	Gould & Curry	9,610
Mono	3,115	Hale & Norcross	9,896
Standard	33,994	Julia	1,687
Syndicate	795	Justice	573
WASHOE MINES.		Kentuck	2,623
Alpha	$3,866	Lady Wash'n	1,741
Alta	1,282	Mexican	6,232
Andes	2,122	Ophir	637
Belcher	9,116	Overman	2,765
Best & Belcher	6,464	Occidental	1,760
Bullion	6,837	Potosi	14,316
Caledonia	2,998	Savage	2,147
Challenge	1,373	Scorpion	657
Chollar	3,842	Seg Belcher	6,342
Con. Cal & Va	52,250	Silver Hill	1,248
Confidence	6,301	Sierra Nevada	14,507
Con. Imperial	518	Union Con	8,453
Con. New York	1,776	Utah	1,273
Crown Point	12,113		

The following illustrates the changes of the week:

MINES.	2	9
Alpha	$ 09	$ 06
Alta Consolidated	.....	.....
Andes	20	18
Belcher	64	56
Best & Belcher	74	70
Bodie	1 10	1 10
Bullion	.....	14
Challenge	.....	34
Chollar	44	.....
Confidence	1 25	.....
Consolidated California and Virginia	3 00	2 85
Consolidated New York	.....	.....
Crown Point	59	48
Exchequer	.....	02
Gould & Curry	45	.....
Hale & Noroross	1 50	.....
Justice	.....	.....
Mexican	77	69
Ophir	1 45	1 65
Overman	.....	09
Potosi	.....	41
Savage	28	26
Sierra Nevada	77	70
Union	47	46
Utah	.....	.....
Yellow Jacket	33	28

San Francisco Stock Board Sales.

SAN FRANCISCO, May 9, 1895.

9:30 A. M. SESSION.

100 Andes	18	100 Con Cal & Va	2 80
100 Belcher	56	300 Mexican	68
100 Best & Belcher	70	200 Occidental	30
100	68	100 Ophir	1 65
300 Bodie	1 10	200 Savage	26
100 Bulwer	11	50 Sierra Nevada	69
400 Caledonia	07	50 Union	46
100 Crown Point	48	100 Yellow Jacket	28

SECOND SESSION—2:30 P. M.

100 Alpha	06	100	29
100 Best & Belcher	69	150 Ophir	1 65
300 Bodie	1 10	150 Overman	09
100 Bullion	14	300 Potosi	41
100 Bulwer	13	100 Savage	25
100 Challenge	34	300 S. B. & M.	14
200 Con Cal & Va	2 85	100	15
100 Exchequer	02	100 Sierra Nevada	70
50 Mexican	69	300 Union	46
700 Occidental	28		

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Alta M Co, Nev	49	10c	May 6,	Jun 11, July 2	J E Jacobus, 309 Montgomery
Andes S M Co, Nev	41	15c	May 1,	Jun 17	J W Twiggs, 309 Montgomery
Brunswick Con G M Co, Cal	8	2c	Mar 20,	Apr 20, May 15	J Stadtfeld Jr, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19,	May 31, Jul 26	J Henry Smith, 431 California
Justice M Co, Nev	59	10c	May 7,	Jun 11, Jun 28	R E Kelly, 309 Montgomery
Occidental Con M Co, Nev	18	10c	Mar 20,	Apr 23, May 15	A K Durbrow, 309 Montgomery
Ophir S M Co, Nevada	65	25c	April 4,	May 7, May 27	E B Holmes, 50 Nevada Block
Overman, Nev	73	10c	Apr 15,	May 21, Jun 11	Geo D Edwards, 414 California
Savage M Co, Nevada	86	20c	Apr 19,	May 22, Jun 11	E B Holmes, 309 Montgomery
Yellow Jacket, Nev	59	25c	Apr 15,	May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETING.

Company and Location.	Secretary and Office in S. F.	Date.
Gold Ridge Con M & M Co	R H Daley, 216 Post	May 20

early days. The "west country" contains many lodes that crop holdly above the surface. Some of these are immense, and all show more or less well in the precious metals —mostly in gold—at the surface. This ground hack of the west wall of the Comstock was very wet in the early days. The shafts sunk by the prospectors who made locations on the veins of that section soon encountered water. Then short drain tunnels were run. As few of these tapped the veins for which they were run at a greater depth than from fifty to eighty feet, they were of little use, further than that some of them furnished a supply of water for use in the town for a time. For over thirty years all this region of unexplored country has lain as left hy the pioneers. Now it may he easily and cheaply drained and prospected to an immense depth hy running a drift into it from the Sutro tunnel. The old owners of the Sutro tunnel were always talking of exploring this region, hut all ended in talk. It is the very biggest thing in sight for the new company. The running of an exploring drift would not interfere in the least with the working of low-grade deposits at the front of the lode. The veins of the "west country" are supposed to he gold-hearing, as gold predominates in the croppings. If so, they can undoubtedly he made to pay, as such ores may he cheaply concentrated if found to he of low grade. From the croppings of one of the veins, the Cole, several hundred thousand dollars in gold was taken at a time when mining, milling and all else was very costly. To open up the "west country" would he to give the Comstock a new lease of life. In running a tunnel west there would also he a chance of finding rich veins that do not show on the surface.

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A statement of the cash halances of the following mining companies on the first Monday of May is appended:

Assessment Notices.

OVERMAN SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Locatiou of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of April, 1895, an assessment, No. 75, of ten cents (10c.) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of May, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 11th day of June, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. D. EDWARDS, Secretary.

Office—No. 414 California street, San Francisco, California.

H. P. TAYLOR MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Liberty Mining District, Siskiyou county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the nineteenth day of April, 1895, an assessment of Four (4c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, 39 Merchants' Exchange, 431 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the thirty-first day of May, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on FRIDAY, the twenty-sixth day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HENRY SMITH, Secretary.

Office: 39 Merchants' Exchange, 431 California St., San Francisco.

ALTA SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of May, 1895, an assessment (No. 49) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 35, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 11th day of June, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on TUESDAY, the 2d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. E. JACOBUS, Secretary.

Office, Room No. 35, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

ANDES SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia City, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the first (1st) day of May, 1895, an assessment (No. 41) of Fifteen (15c) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Rooms 20-22 Nevada Block, 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the first (1st) day of June, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on MONDAY, the seventeenth (17th) day of June, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JOHN W. TWIGGS, Secretary.

Office—Rooms 20-22 Nevada Block, San Francisco, California.

ANNUAL MEETING.

The Regular Annual Meeting of the Stockholders of the Gold Ridge Consolidated Mining and Milling Company will be held at the office of the Company, No. 216 Post street, San Francisco, California, on Monday, the 20th day of May, 1895, at the hour af 3 P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such business as may come before the meeting.

Transfer books will close on Friday, May 17, at 1 o'clock P. M. RICHARD PHELAN, President.

R. H. DALEY, Secretary.

Office, 216 Post St., San Francisco, Cal.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from T. G. Phelps, in the Liberty Hill mine, Nevada Co., and John Spaulding, in the Polar Star mine, near Dutch Flat, Placer Co., to impound tailings behind the Liberty Hill dam, in Bear river; and from Ah Wing, in the St. Lawrence mine, near Moores Flat, Nevada Co., to impound tailings behind brush dam in Illinois canyon, gives notice that a meeting will be held at Room 92, Flood Building, San Francisco, Cal., on May 13, 1895, at 1:30 P. M.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medica College, of New York City.

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One in a residence means a sale to all the neighbors. Fine instruments, no toys, works anywhere, any distance. Complete, ready for use when shipped. Can be put up by any one, never out of order, no repairing, lasts a life time. Warranted. A money maker. Write

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226 MARKET ST., N. E. Corner Front (Up Stairs), SAN FRANCISCO. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential.*

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All kinds of tools. Fortune for the driller by using our Adamantine process; can take a core. Perfected Economical Artesian Pumping Rigs to work by Steam, Air, etc. Let us help you. THE AMERICAN WELL WORKS, Aurora, Ill.; Chicago, Ill.; Dallas, Tex.

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Silver Plated Copper Amalgam Plates

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GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

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Every description of work plated. Send for Circular.

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524 Sacramento Street, San Francisco, Cal.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING APRIL 30, 1895.

538,575.—Bath Cabinet—E. D. Andruss, Seattle, Wash.

538,630.—Wrench—Bohrn & Hale, Gualala, Cal.

538,698.—Wave Motor—P. Breitenstein, Klamath Falls, Or.

538,692.—Amalgamator—G. W. Downs, Port Townsend, Wash.

538,442.—Hog Catcher—P. S. Driver, Sacramento, Cal.

538,578.—Flashlight Apparatus—W. B. Farwell, S. F.

538,511.—Fuel Saver—Annie Glud, Oakland, Cal.

538,523.—Rock Crusher—J. H. Kinkead, Virginia, Nev.

538,601.—Pipe Tongs—G. F. Seymour, S. F.

538,236.—Printing Press—H. Swain, S. F.

538,556.—Fan for Rocking Chairs—J. Welget, S. F.

538,570.—Step Ladder—Frank White, Pomona, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail (or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press U. S. and Foreign Patent Agency, the following are worthy of special mention:

Step-Ladder.—Frank White, Pomona, Cal. No. 538,570. Dated April 30, 1895. This invention relates to that class of step-ladders in which the legs are connected at their upper ends to the ladder, by means of a freely playing joint, or such a combination of hinges as will enable them to be moved independently of one another and in either direction with respect to the plane of the ladder. The point of improvement consists chiefly in independently moving legs connected at their upper ends to the ladder, one behind the other, in the central transverse plane of the ladder. The object of this improvement is to provide for the greatest safety, durability and strength, combined with perfect adjustability under all circumstances, and automatic action in the ladder, in fitting itself to whatever surface it may be upon.

Wave Motor.—Paul Breitenstein, Klamath Falls, Or., assignor of one-half to Anton Glock, Oakland, Cal. No. 538,498. Dated April 30, 1895. This invention consists of an apparatus which is designed to transmit motion and power from a float which is actuated by the rise and fall of the waves so that machinery may be actuated by the power thus transmitted. It consists of a rocking or tilting float with vertical guides between which its movable parallel shafts journal in stationary supports, gear-wheels fixed to said shafts engaging with each other, drums turning loosely upon the shafts and pawl and ratchet mechanisms by which the drums are engaged to rotate both shafts when turned in one direction and released when turned in the opposite direction, and ropes or chains connected with opposite ends of the float, each set of ropes passing over the drums nearest their point of attachment to the float and then beneath the drums upon the adjacent shaft and over pulleys to counterbalance weights whereby the upward movement of either end of the float acts to rotate the two shafts continuously.

Fuel-Saving Appliance for Grates.—Annie Glud, Oakland, Cal. No. 538,511. Dated April 30, 1895. The object of this invention is to provide a device which, when fitted into a grate, so changes the currents of the draft with relation to the fuel as to make a perfect combustion, not only of the body of the fuel, but of the smoke and gases which ordinarily escape therefrom, and to make a more constant fire and increase the duration. It consists of a tight box having a bottom, back and ends, and adapted to fit into the grate with the front and top open, so that when the fuel is placed in the grate and ignited, there will be a sort of downward draft from the front and top, passing through the fuel, and thence up in the rear portion of the box to the chimney. After the fuel becomes ignited and incandescent, all the smoke and gases of combustion are drawn down by this action and again passed through the incandescent fuel whereby a much more complete combustion is produced.

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(Stationary, Locomotive or Marine; Mechanics; Mechanical Drawing; Electricity; Architecture; Architectural Drawing and Designing; Masonry; Carpentry and Joinery; Ornamental and Structural Iron Work; Railroad Engineering; Bridge Engineering; Municipal Engineering; Plumbing and Heating; Coal and Metal Mining; Prospecting, and the English Branches. Students make rapid progress in learning to Draw and Letter. The Steam Engineering course is intended to qualify engineers to secure Licenses. Send for Free Circular, stating the subject you wish to study, to

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P. & B. INSULATING TAPE. ARMATURE VARNISH. ELECTRICAL COMPOUND.

STANDARD OF EXCELLENCE—USED IN ALL FIRST-CLASS ELECTRICAL WORK.

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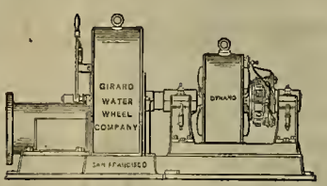
Sole Manufacturers of P. & B Paints, Roofing, Building Papers.

American Girard Water Wheel.



Adaptable to all heads between 30 feet and 2000 feet, particularly where economy in the use of water and fine regulation are desired as, for instance, the operation of electric dynamos.

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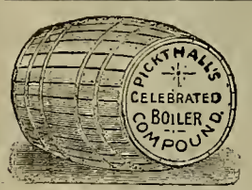

PICKTHALL'S Celebrated Boiler Compound —FOR— Removing or Preventing Scale, Corrosion and Pitting in Steam Boilers.

Will save its cost in fuel, boiler repairs or labor.

Vulcanized Fiber Valves —AND— Ordinary Rubber Valves, For Hot or Cold Water. Pure Rubber Air Pump Valves. Combination Ring Packing For Piston Rods of Engines, Steam, Water or Ammonia Pumps. FLAX PACKING —AND ALL— ENGINEERS' SUPPLIES.

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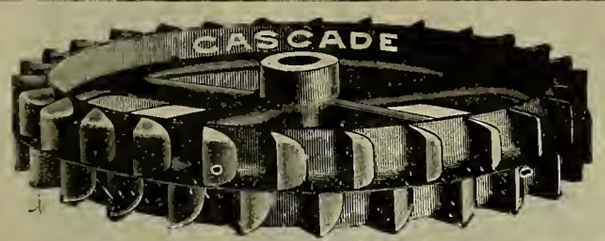
WATER WHEEL



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Adapted to all heads, from 30 FEET TO 2000 FEET. Our experience of 33 YEARS in the water wheel business enables us to suit every requirement of water power plants. Send for illustrated pamphlet. This new wheel has given an unequaled Economy in Water.

JAMES LEFFEL & CO. Springfield, Ohio, U.S.A.

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If you want a quick-opening valve for Steam, Water, Oil, etc., try "Lunkenheimer's" Lever Throttle Valve. Warranted the simplest, best and most durable Quick-Opening valve made. An excellent Throttle for Traction Engines, etc. Specify and insist upon "Lunkenheimer's." None genuine without our name. Write for catalogue of superior Specialties for Engine and Boiler purposes, Valves, Lubricators, Oil Cups, Grease Cups, Whistles, Cocks, etc.

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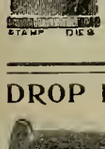
Adamantine Shoes and Dies —AND— CHROME CAST STEEL Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

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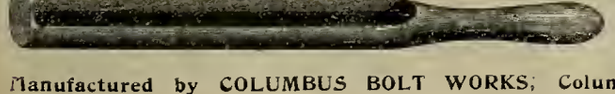
DROP FORGED MINER'S SPOON. Sample by Mail, 10c.



THIS CUT ONE-HALF SIZE.

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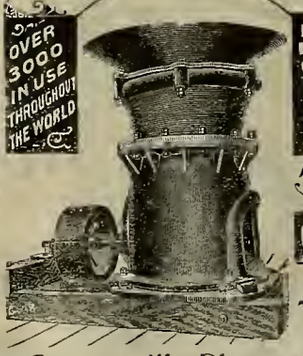
GATES ROCK AND ORE BREAKER



OVER 3000 IN USE THROUGHOUT THE WORLD

PRODUCES A MORE PERFECT CUBIFORM MATERIAL AND A GREATER QUANTITY IN A GIVEN TIME PER HORSE POWER USED THAN ANY OTHER CRUSHER ON EARTH.

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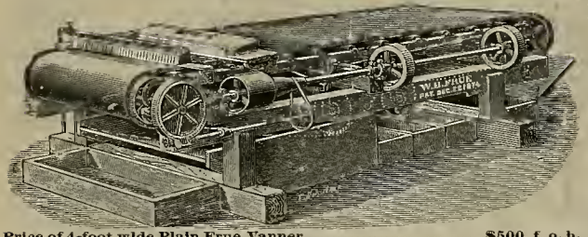

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MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill.
C. J. CLARK, Gen'l Supt.

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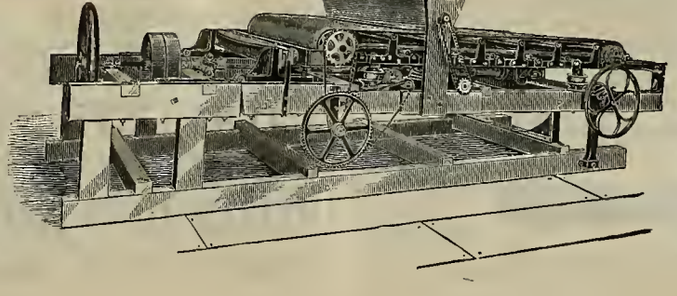

FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.
THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94¼ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works.

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VOLUME LXX. Number 20. SAN FRANCISCO, SATURDAY, MAY 18, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

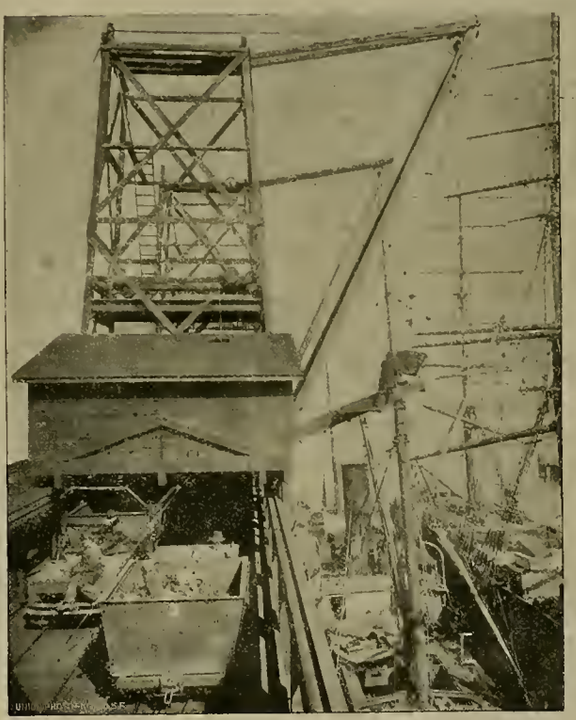
How Coal Is Handled Here.

The great amount of coal that is annually brought to this city by the fleet of steamers plying between here and the northern mines constitutes an important item in our industrial life. Oregon, Washington and British Columbia furnish most of that factor of commerce, and its transit and delivery are interesting.

R. Dunsmuir & Sons have recently completed a system of handling coal here that in magnitude and efficiency is unsurpassed on this coast. They own the Wellington mines on Vancouver Island, B. C., the annual output of which is 450,000 tons. Their two steamers, the Wellington and Costa, each carrying 2400 tons, are constantly in transit. The firm's coal-handling plant in this city includes two bunkers, one 290x36 feet, the other 240x60, each capable of holding over 5000 tons of coal. A high bridge 204 feet long, across Steuart street, connects them with the wharf. The complete electric system of transmission, just completed, enables them to handle the coal with an economy and dispatch that is profitable and satisfactory, the retailer and the public sharing in the accompanying reduction in cost. The firm does a very large business, 125 men and twenty-four carts being daily busy delivering to the retail dealers in this city; 700 men are employed in and about the mines, and, including all employes, there are over 1000 names on the payroll.

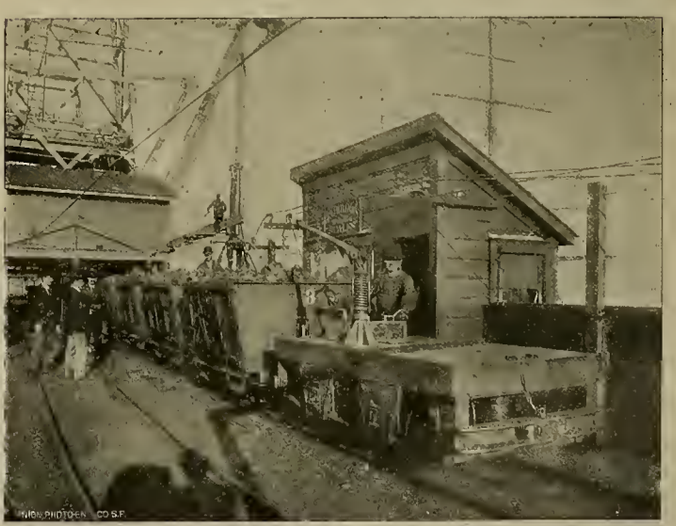
The accompanying illustrations, for whose use we are indebted to the courtesy of Mr. Jared C. Hoag, convey a graphic idea of how the coal is handled here, from the time it arrives in the hold of the vessel till it is shot from the chute into the cart or sacked ready for delivery.

ARRIVAL AT THE WHARF.



UNLOADING THE COAL.

MAKING UP A COAL TRAIN.



WEIGHING THE COAL.

A SATISFACTORY TEST for operating street cars has been made in New York. The power used was compressed air; the loss of power is but twenty per cent.

MINING AND SCIENTIFIC PRESS.

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J. F. HALLORAN.....General Manager

San Francisco, May 18, 1895.

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FOR the last year the export of silver bullion is by a more natural trade route than heretofore, being via this city, Colorado, Utah and New Mexico now sending the bulk of their silver product here for refinement and transmission. It is probable that at least so long as the Government is not a purchaser the trend of the business will continue this way.

The Debris Commission.

Unusual interest attached to last Monday's meeting of the U. S. Debris Commission, at which time, among other applications, that of the owners of the Liberty Hill mine, Nevada Co., was made. There was also an application from the Polar Star, in Placer Co., the proposition in both cases being to raise the Liberty Hill dam in Bear river to an extent sufficient to effectually bar the exit of any debris. T. G. Phelps appeared on behalf of the applicants. W. T. Phipps and R. T. Devlin represented the Anti-Debris Association. The oppouents of the proposition made impassioned haraugues, and called upon high Heaven and other places to hear witness to the proposed outrage. Mr. Phelps contented himself with a brief recital of facts, and said it was a matter that necessarily must be submitted without argumeut, it being wholly for the members of the Commission to decide from their own personal judgment and observation. He said:

"Our property has been idle a long time, and we have been under great expense. It is the province of these engineers to determine the sufficiency of dams. We will build permaneut and effective restraining works, aud the Commission can pass upon them.

"If these works comply with the requirements of the board we have no fear but we will be allowed to use them. The gentlemen who oppose the granting of this application say that dams should be built by or under the supervision of those who might be injured by them, in case they prove ineffectual. Now, their engineer, Mr. Allardt, built this dam."

The applications in both cases were refused. Their decision in these matters is final, and their action is not to be criticised nor controverted, the assumptiou being that they act in strict accordance with their interpretation of the Caminetti act. At the same meeting three other applications were granted.

The first suit under the new law began on the 17th inst. in the U. S. District Court in this city, the action being brought by the Commission against the North Bloomfield Mining Co., for alleged failure or neglect to comply with one of the provisions of the law which requires all hydraulic mine managers and owners whose property is contiguous to navigable streams or their tributaries to file a petition to have such mine examined preparatory to operation.

California Coal.

Though we annually consume about 1,500,000 tons of coal in this State, we annually produce less than 100,000 tons. The great bulk is imported from British Columbia, England, Washington, Oregon and other localities. We have coal in Amador, Alameda, Contra Costa, Humboldt, Fresno, Monterey, Mendocino, Riverside and San Diego counties, and uow that there is a general awakening to the necessity of developing our natural resources, the Manufacturers' and Producers' Association rightly reason that no line is of more direct importance to the interests they represent than that of securing sufficient coal at prices helow what we have hitherto been compelled to pay.

For over thirty years the existence of extensive coal deposits has been known at Corral Hollow, Alameda Co., and considerahle prospecting has beeu done, with results commensurate with the amount of effort involved. Recently the Fuel Committee of the Manufacturers' and Producers' Association was led to investigate this coal miue by reason of its contiguity to this city, ease of access and quality of its output. They report as follows:

We visited the coal mines at Corral Hollow, the property of the San Francisco and San Joaquin Coal Company.

The coal mines are clearly traceable in, and include, a territory over six and one-half miles long and one and one-quarter miles wide, lying in Corral Hollow valley, ahout ten miles southeast from Livermore and eighteen miles from navigable tide water.

The inspection left no doubt in our minds of the immense quantity of available coal, and we are not disposed to question the engineer's estimate of 20,000,000 tons. The veins dip from 50° to 70° approximately, and are visible in numerous other tunnels and openings visited by the party along the course of the veins for a distance of over six miles.

As to the quality and character of the coal, it is, wheu freshly mined, or in the veins, a deep jet or glossy black lignite. We watched it as used in the several boilers of the coal company, finding it to ignite readily and burn freely, making a very hot fire, leaving no clinker and hut a small proportion of ash. It seems to have the quality of high-grade lignite like the New Mexico coals and others now in use in California.

The comparative value of the coal in stationary boilers is now heing determined hy practical tests in this city and power plants here and in Oakland. More important is the result of a month's test hy the Southern Pacific Railroad in its engines on the Oregon express between Sacramento and Red Bluff, the report of which concludes as follows:

"The result of the test shows conclusively that the Corral Hollow coal is entirely satisfactory for locomotive use."

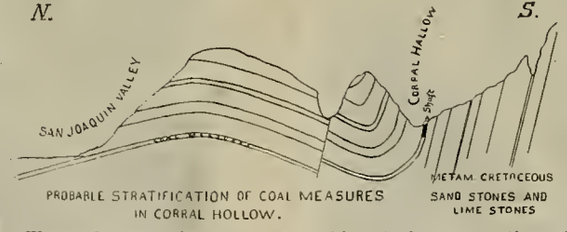
The managers assert an offer to contract to deliver to the San Francisco & San Joaquin Railroad, at the mines, the entire supply required hy them, for five years, at $2 per ton.

They also say they will he able to mine, with proposed facilities, 2000 tons per day, and to market the same in San Francisco for $2 per ton, and maintain a selling price not to exceed $3 and $3 50 per ton, hased on handling coal over their own railroad to tide water and thence, in steel barges, to San Francisco or accessible river points. The resulting 600,000 tons a year would represent over one-third of the average importation and commercial supply, and, if maintained, prove a potent factor hoth in stimulating industries and keeping a large amount of money at home.

San Francisco can hardly hope for cheap coal from any source hut these mines, on account of the distance hetween San Francisco and other coal fields. From the personal examination we have made, we are of the opinion that there is enough coal there to supply the city's entire consumption for many years.

This is as favorable as any similar report could possihly he, probably more favorable than the proved facts will bear out, but sufficieutly authentic to warrant attention and affirmative action.

The accompanying sketch illustrates the geological features of the formation.



PROBABLE STRATIFICATION OF COAL MEASURES IN CORRAL HOLLOW.

The coal measures are presumably of the same geological age as those of Mt. Diahlo, and a coutiuuation thereof, though if the report is to be accepted as competeut authority the quality is greatly superior to the output of the Mt. Diahlo mine.

When it is considered that we pay from $5 to $12 a ton for the million and a half tons consumed, it will be seen how potent a factor coal is in our industrial life, and how importaut it is that auy domestic source be exploited. If half of what is so strongly asserted regarding the Corral Hollow coal bed be so, the problem approaches solution.

REGARDING the law requiring $100 in work or improvement annually on unpatented mining claims, a correspondent is informed that he is right in his belief that a bill was introduced in the 53d Congress changing the time from January 1st to October 1st. The bill passed one house, but was not acted upon further, and the law is as before; that is: according to the custom of the Commissiouer of the General Land Office the year dates from January 1st instead of from July 1st, the first day of the year as observed in the office of the U. S. Treasurer. A liberal construction of the law allows a miner the entire year in which to perform his assessment work; say a claim is located to-day, May 18th, 1895, the claimant is allowed till midnight December 31st, 1896, in which to do his first $100 worth of work.

Patenting Mining Claims.

Secretary of the Interior Smith has made another ruling that has all the force of a decision regardiug the patenting of mining claims. It has hitherto been the custom crystallized into acceptance that where a group of mining claims were simultaneously worked by joint owners a total of $500 in labor and improvements sufficed to justify application for patent. The Secretary's ruling is, in effect, that $500 worth of labor and improvements must be put on each of the claims in a group.

The main point in the case at issue was whether the property in dispute was or was not mineral land. The Secretary of the Interior decides that it was mineral laud, and then goes on to make the ruling. The case was that of W. J. Sweeney in the Helena, Montana, land office, who applied for U. S. patents to seven contiguous lode claims. The N. P. Co. contested, alleging that the land was within its grant. After deciding that the land was mineral, the Secretary says:

"But there is au objection to this mineral application that is, in my judgment, fatal to it as it stands. Amoug other requirements of Sectiou 2325, United States Revised Statutes, is one that demands that the certificate of the United States Surveyor-General must show that $500 worth of labor has been expended or improvements made upon a claim hy the applicant or his grantors. An examination of the report of the deputy surveyor shows that upon the Waterbury lode there is a discovery shaft four aud one-half by six feet, fifteen feet deep, of the value of $75; on the Naugatucket lode, a discovery shaft five by six feet, five feet deep, valued at $15; on the Friday lode a discovery shaft six by seven feet, five feet deep, valued at $20; on the Glucose lode a discovery shaft four and one-half by six feet, ten feet deep, valued at $50, and an opeu cut five by six feet, six feet deep, valued at $15. This is all the work or improvements shown to have beeu made upon these four claims, and, unless it cau he shown that the work done on the others was for the development or convenient working of the balance, the application should be rejected.

"The work upon the other claims shows that shafts have been sunk from twenty to fifty feet on the same, but there is nothing to show that this work was done with a view to developing the claims first named or that they have been used for that purpose.

"Again, the total amount returned by the surveyor as the value of the improvements is but $3305, whereas, for the seven claims, it should he the full amount of $3500.

"I am therefore of the opinion that unless a satisfactory showing can be made that this work or improvement to the amount required by statute had been performed, or that the work which has been done was for the common benefit of all the claims, the application should be rejected as to the Waterbury, Naugatucket, Friday and Glucose lodes. The judgment of your office is therefore modified."

A CONTROLLING INTEREST in the New Idria quicksilver miues has been purchased by Boston and New York parties, who are principal stockholders in the Napa Con. Q. M. Co. and Ætna Q. M. Co. Mr. B. M. Newcomb has been appointed superintendent, with Mr. E. G. Holmes as assistant, who will reside at the mines. Improvements are iu coutemplation, but as yet the force has not been materially increased.

UNDER amended British Columbia mining laws placer claims are limited to 1500 feet in length.

Concentrates.

THE Miners' Association of Shasta Co. meets at Redding to-day.

A MINERS' UNION has been formed in Rossland, B. C. D. B. Bogle is secretary.

GREAT BRITAIN'S net imports of gold amounted to £11,917,375 in 1894, as compared to £5,332,454 in 1893.

A COMPANY has incorporated in Creede, Colo., which will do the annual assessment work for non-resident claim owners.

THE Black Butte mine, in the Long Creek country, Pendleton, Or., has been bought for $50,000 by John Gagen of Pendleton.

BY an explosion in the mines of the Colorado Fuel and Iron Company, at Sopris, Colo., last Saturday, four men were instantly killed.

JOHN MCCALL, formerly superintendent of the West Harmony mine, sold the McCall gravel mine in El Dorado Co. this week for $40,000.

THE Hurley mine at West Point, Cal., is now paying up all its indebtedness, and it is the announced intention to again start up the work.

TWENTY-FIVE men are employed at the Eagle Bird mine, Nevada Co. Twenty stamps are continuously in operation with good results.

THE Mining Exchange Building Company of Denver, Colo., last week made an assignment without reserve for the benefit of creditors.

IN Gila county, Arizona, the Kasser Mining and Milling Company have put on twenty men, preparatory to putting in a fifteen-stamp mill.

THE Queensland yield of gold for the first quarter of 1895 was 135,641 ozs., as compared with 130,488 ozs. for the corresponding quarter of last year.

TWELVE Indians from Mexico recently fired on miners near Fort Bowie, Ariz. Troops were ordered from Fort Bayard to run the Indians down and capture them.

THE 19,000 ounces of gold produced at the Independence mine, Cripple Creek, Colo., during the first three months of '95 cost seventy-nine cents per ounce to produce.

THE Pitch Pine Gold Mining Company has incorporated in this city; capital stock, $100,000. Directors—F. McCann, W. R. Townsend, C. H. Coffin, J. Grady and T. Frolich.

ALL work on the Hardenburg mine, near Middle Bar, Amador Co., has been suspended indefinitely. The Farrell mine, in the same locality, will be started up about the 1st prox.

E. H. HUMPHREY has bought the S. F. Xavier mining claim in southern Arizona for $6,000. It is an extension of the La Esperanza from which such rich ore was taken last summer.

UNLESS Spokane, Wash., hurries up Baker City, Or., will have a smelter first. Railroad and mining men of St. Louis are about to put up a $75,000 smelter of 20 tons daily capacity there.

THOMAS QUINN, who recently bought the Hammersley mine, near Jump-Off-Joe, Or., is now credited with the purchase of the Golden Standard mine on Galls creek, Or., for $40,000.

OVER 1,000,000 pounds of sulphurets were loaded at Colfax during the month of April, says the *Sentinel*, consigned mainly to the Selby Smelting Works, this city, and to Everett, Washington.

FRED BRADLEY is about to put in four new crushers at the Spanish mine, Nevada Co., and will, in addition, run the ten-stamp mill, the intention being to crush over 100 tons of ore every twenty-four hours.

THE French company that has made such large investments in mines and water rights in Trinity Co. have lately extended operations to Salmon river mines in Siskiyou, and will engage in hydraulic mining there.

THE surveyors for the Iron Mountain Company, in Shasta Co., have not yet finished their work. The general supposition is that the company will build a reduction plant in the neighborhood of old Hogtown.

THE Pacific Bullion & Mining Company, of Spokane, intends to commence work soon on the Spokane and Trinket at Ainsworth, B. C., from which a considerable quantity of good grade ore was shipped in 1890.

THE gold output of the Transvaal for October, November and December, '94, was 589,342 ounces, valued at £2,014,085. This, like a good many other statements in this column, is in answer to a query from a reader.

THE Channel Bend Mining Company has incorporated in this city. Directors—J. M. Cunningham, G. Whittell, W. E. Davis, J. L. Bradbury, J. P. Langhorne; capital stock, $75,000, of which $30,500 is subscribed.

THE *Transcript* hears that Nevada county will assist to put in a road from Truckee to the English Mountain quartz mine. The entire unpaid indebtedness of the English Mountain Company is said to be about $7000.

THE Golden Fleece Mining Company, operating in the Hinsdale country, Colorado, paid a regular dividend of two cents per share, $12,000, last Wednesday. The earnings for last month are estimated to be $100,000.

THE Aztec mine in Colfax county, New Mexico, yielded $21,000 last week, making a total product for that little mine of about $1,000,000 up to date: there are a good many adjoining mines that are doing nearly as well.

THE Eagle Mining, Milling and Water Company has incorporated in this city. Capital stock, $500,000: directors. T. Reichert, F. A. Hyde, E. D. Porter, A. L. Stetson, L. J. Hendrick, S. J. Coop, J. H. Schneider.

THE Western Federation of Metalliferous Miners in session this week at Denver, Colo., admitted the Coal Miners' Union to membership, bringing the number up to over 40,000. The organization reports a surplus of nearly $500,000 in the treasury.

CHARLES SIMMONS, a miner in the Gagnon, near Butte, Montana, was killed last Tuesday while coming up out of the mine in a skip on an inclined shaft. The engineer did not wait for the proper signal, but hoisted before Simmons was ready. His head was caught between the skip and the shaft and almost severed from the body, which dropped 400 feet into the sump.

ARTICLES have been filed in Spokane, Wash., incorporating the Robert E. Lee and the Eureka Consolidated Mining Companies, each with a capital stock of $500,000, "to own and operate mining properties in the United States and British Columbia."

TO THE 12th inst. the clean-ups at the West Harmony gravel mine amounted to over $7,500. Last month the mine produced about $5,700. The gravel that is being taken out now is of high grade, and the *Transcript* says the mine is looking better than it ever did before.

A CYANIDE mill to cost $5,000 is to be erected at Seymour, Arizona, to work the tailings of the Vulture mine, of which there are 25,000 tons, and will take years to work them. A 200-foot well has been sunk to replace the one that caved in during the last rise of the Hassayampa.

LAST Monday the California Debris Commission granted permits to carry on hydraulic mining to the Iowa and Tiger mines, in Placer county, and the American House mine, in Plumas county. Permits for the Liberty Hill and Polar Star mines, near Dutch Flat, were withheld.

OFFICIAL statistics of the production of minerals in Ontario for the year 1894 are at hand. The quantity and value of mineral productions for the year, with number of workmen employed and amount of wages paid for labor, aggregate $6,088,758. Number of employes, 6,075: wages, $1,840,289.

A. D. MCDONALD and James Mabrinto while at work in the Rarus mine at Butte, Montana, were crushed to death, last Sunday morning, while coming up from the bottom of the cage. Mabrinto fainted, and in falling, it is supposed, dragged McDonald with him. Both bodies were dragged up along the timbers and terribly mangled.

THE monthly bullion report of the Chollar—ore worked at the Nevada mill during April—is as follows: Tons worked, 867; gross proceeds in bullion, $17,302; cost of reducing, $5202; net proceeds in bullion, $12,100; assay value per ton, $25.39; gross average per ton, $19.96; net average per ton, $13.96. Mill worked 78.6 per cent.

MR. CECIL RHODES, of South African fame, in pushing north ward in equatorial Africa, has met the French going southward from Upper Egypt. To their remonstrances he told them "to go to hell." He was "there first, and meant to stop there." So far the parties of the second part haven't made up their minds what they are going to do about it.

IN the Utah mining case, wherein the Eureka Hill Mining Co. demanded judgment for $90 000, alleged to be due for ore extracted from the Silver Gem mining claim, adjoining the Caroline claim in the Tintic mining district, and the Bullion-Beck and Champion Mining Co. alleged that the value of the ore taken did not exceed $1450, the jury gave a verdict for $3924.66.

JOHN GRANDOLFO is at Tucson arranging for the transfer of the Sierra Pinta gold properties in Sonora, well down on the gulf coast. Owing to their isolation and scarcity of water the mines have not been worked much. He asserts that 400,000 tons of $25 ore have been blocked out, and the water problem will be solved by deep wells. These failing, sea water with steam condensers will be used.

IT is considered probable that the Old Dominion Copper Co., at Globe, Arizona, will resume operations this summer. There is now 3500 tons of ore in the bins, and space is being cleared for the erection of another large bin. When the new railroad is completed to the reservation line a proposition will be made to the railroad company by the Old Dominion people for transporting coke and copper bullion.

A GREAT cave wrecked the Frisco mine at Gem, Idaho, one night last week. Luckily it happened between shifts, and no one was hurt. It took in 240 feet, and demoralized the mine. Twenty-nine floors caved. Faulty timbering was the cause, and a former superintendent is blamed. The miners had predicted the accident, which will cost several thousand dollars to repair. The cave showed up considerable good ore, which will help pay for the damage.

FIFTEEN prospectors have just left Seattle, Wash., on the schooner Ellwood, bound for Cook's inlet. They take along a year's supplies, and will thoroughly explore part of Alaska. The party is headed by Jaems Germansen, a pioneer explorer, one of the few men to cross the continent through the Arctic timber belt, leaving St. Paul, Minn., in 1866, striking the Pacific coast in northern British Columbia some four years later. He discovered on that trip the well known Omineca, or Peace river gold mines.

A. F. AND J. P. NICHOLLS, who have been operating an extensive gold-saving machine on the Columbia river, near Chelan, Wash., have abandoned the undertaking, having demonstrated that the pay streak is too limited to justify extensive work. About a year ago a general stampede was made to the Columbia bars, and it was thought that the entire Columbia river benches contained gold in paying quantities, but the conclusion of Nicholls Bros. seems to have settled the question and other fields are being explored.

THE gentleman who made the sale informs the PRESS that the Washington mine, French Gulch, Shasta Co., was sold this week. Negotiations have been in progress for a considerable time. The purchasers are M. J. Luther and others of Chicago and New York. They will immediately tear out all the old plant and put up a new 20-stamp mill. The original proposition was to take the Washington, Empire and J. L. C. M. A. Delano will superintend the building of the mill and the development of the property. The price is $90,000, in three installments. The first payment was made last Monday.

THE tin mines of Cornwall are threatened with destruction because of the cheap tin produced in the Orient in the Straits Settlements. In the Straits the mine owner pays his men in silver, but gets his pay in London in appreciated gold. Paying his miners in low-priced silver and getting his own money in gold enhanced to double its old price, the tin miner has a good thing. The doubling of the value of the money used in one part of the world and the cheapening by one-half of the money in use in another part, gives the tin miner of the Straits a sword that cuts both ways. With cheap silver he is able to work to a profit mines so lean in metal that were they in Cornwall they could not be touched. The fall in the price of tin, owing to the cheap production of that metal in the Straits Settlements, is fast ruining the Cornish mines. Silver at commodity prices closes the low-grade mines of Cornwall, as it opens those of the Straits. In 1893 the mines of Cornwall produced only 2000 tons of tin, while the Straits produced 39,670 tons, and the output is still steadily increasing.

ACCORDING to figures procured by the *Examiner* at the Mint the average deposit of gold dust directly from Chinamen who are working the "old diggings," or abandoned claims in the placer districts of this State, is $40,000 per month for eight months in the year, beginning with April and ending with November, inclusive. Besides this amount it has been ascertained that $20,000 in dust finds its way to the Mint during the same period in each year through Wells, Fargo & Co., the First National and the California banks, from the various Chinese mining camps. This is a total of $60,000 per month, or $480,000 for eight months in each year.

THE Champion mining district, near Deer Lodge, that gave promise at one time of becoming one of the greatest producers of silver in Montana, is now utterly deserted save by the night owl and the ground squirrel. The owners of the Champion mine, the principal property in the district, have been engaged during the past week in moving all their hoisting machinery to town, where it is being stored and thus saved from the corrosive influences of the mineral and dampness. The Champion mill, built on the outskirts of Deer Lodge at a great expense for the treatment of ore from that district, was compelled to hang up its stamps before its merits were fairly tested, and is now occupied by a solitary watchman.

THE recent rich discovery in the Hope mine at Basin, Montana, was accidental. Workmen were engaged in putting in timbers, which would soon have covered this rich pay streak, when one of the men in digging a hole was struck by the appearance of the ore, which he took to be some kind of iron ore. The foreman being close by, his attention was called to it, whereupon he took a hammer and attempted to break it. Instead of breaking it bent, and a further and closer examination proved it to be almost solid gold. It is estimated that $3000 worth of specimens were carried out of the mine the first day; but it is different now. The men are searched as they come from their work, and a canvas catches the smallest particles of the ore.

SAYS Verdenal in his Sunday *Chronicle* chat: John Sevenoaks, the irrepressible mine-hunter, has in a measure settled down as general manager of the C. O. D. mine over at Cripple Creek, Colorado. Several months since when this property was only a prospect, the owners were willing to sell at $200,000, and a bond was sent over to Paris for French consideration. The Frenchmen are so taken up with South African schemes that they had no great appetite for Colorado. Meanwhile they continued to develop the C. O. D., and made a big strike. The owners cabled their Paris representatives to withdraw the mine from the market, and the owners, under Sevenoaks' direction, are going to run the property for themselves. "It's better to keep the property for Americans anybow," says Sevenoaks.

A VIRGINIA, NEVADA, dispatch says the directory of the Comstock Tunnel Company has placed an order for the delivery of 3,000,000 feet of lumber at the mouth of the Sutro tunnel during the current year. The plans of the new management include the extension of the tunnel under the peak of Mount Davidson, one mile east of its present terminus, and the retimbering of the main tunnel and branches, representing a total length of nine miles of underground workings. The veins cut in driving the main tunnel are to be followed north and south and the ore extracted will be reduced at mills to be erected at Sutro, thus saving the cost of hoisting to the surface and transportation. John W. Mackay is reputed to be one of the promoters of the plan for the extension westward of the main line of the tunnel.

ALTHOUGH it is claimed that the gold output of Cripple Creek, Colo., for '94 will be double what it was last year, there is little if any increase in the mint receipts from that camp. More of its gold than ever is being shipped to New York. There has always been more or less dissatisfaction with the local mint receipts for Cripple Creek gold, but that does not account for the amount of gold sent direct to the Eastern centers. The Cripple Creek gold is of fine quality, and it is claimed that the process in use at the local mint is not quite satisfactory in its treatment. The Boston and Colorado Smelting Company sends its gold still to the local mint, and the management expresses perfect satisfaction with the returns. No offer has been made to the company from the East to purchase its gold at a premium.

THE famous Poorman mine, in the Trail creek country, British Columbia, for which P. Clark paid $22,000 one year ago, has just been sold by the same man to an English syndicate for $1,000,000. The Trail creek country is a gold mining district, extensive bodies of free-milling ore running from $28 to $90 per ton running through the entire country, and since the developments on the Poorman in the last year, hundreds of new discoveries have been made. So great is the confidence of Montana mining men in the district that stocks are being floated in Butte and Helena on mines that are nothing but prospects. All a man has to do to have his stock quoted is to give evidence that he is located on the belt. The district is about seventy-five miles from the railroads, but two lines are now being constructed to put it in close communication with the outside world, one a branch of the Spokane & Northern and the other from the Canadian Pacific. Some of the best ores of the district are rich enough to stand transportation by wagon to Tacoma.

A YEAR AGO some Massachusetts men bought the Good Hope mine in Riverside county. It is now alleged that they paid $250,000 for the property and have invoked the assistance of the law to have $100,000 taken off, they, for cause, claiming that the mine was "salted." They charge that Jas. Sigafus, the former owner of the mine, fooled their expert, Col. Jack Egan, and selected the particular pieces of ore that he used for sample run. J. B. Doran, a former foreman, testifies that during that run selected ore was used, and that Sigafus put gold on the plates. A. L. Jepson, the millman, makes additional statement corroborating the theory. All this is in the form of an answer which Messrs. Morse, Hobson and Porter of Haverhill, Mass., make as defendants in a suit to foreclose the $100,000 mortgage. A motion to appoint a receiver for the mine is also pending. Any attempt to "salt" a mining claim is always sure to be found out, and the knowledge of this fact militates against the successful prosecution of the practice. It is a common occurrence to make such a charge, but in nine cases out of ten the facts do not bear out the allegation.

Geology of Placer, El Dorado and Amador Counties.

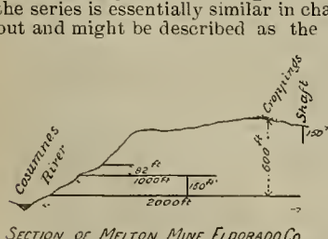
The Placerville folio of the Geologic Atlas of the United States is received. This sheet comprises a part of the middle slope of the Sierra Nevada in Placer, El Dorado and Amador counties in this State. The elevations above sea level range from 300 feet in the southwest corner to 5400 feet in the northeast. The prevailing character of the topography between the rivers is that of irregular and undulating plateaus cut by steep ravines and gulches; in the higher eastern parts gently sloping tables are formed by the surfaces of the Neocene volcanic flows. The high bedrock ridges of the Slate mountains rise above these flows in the northeastern part of the sheet. The three forks of the American river and the three forks of the Cosumnes have cut precipitous canyons through this table land. These canyons attain a maximum depth of 2500 feet and their slopes are inclined at a maximum angle of about 40°.

AURIFEROUS SLATES.

Calaveras formation.—This group, which includes the oldest strata in the region, consists of two belts of rocks, one lying to the east and one to the west of the main belt of Mariposa slates. The series to the west consists of highly compressed black slates and black sandstones, and fine grained siliceous rocks (pthanites), the latter at least in many cases intimately connected with and derived from limestone; the black slates are not very fissile, but weather into irregular fragments. In the northwestern corner of the sheet there are a few isolated limestone masses. The one crossing the north fork of the American river is about 300 feet wide and about two miles long. Fossils indicating Carboniferous age have been found in the limestone masses southeast of Applegate's near the Central Pacific railroad, and also in the limestone mass exposed in the middle fork of the American river, two miles above Mammoth bar. In both places the characteristic forms are corals. This western belt of the Calaveras formation contains areas of fragmental volcanics and dikes and masses of basic igneous rocks, chiefly diabase and hornblende-porphyrites. The Calaveras formation east of the Mariposa beds consists of a succession of clay slate, sandstones and quartzites with lentils of limestone, and along the south fork of the Cosumnes river there is a good deal of mica-schist. The clay slate is, when fresh, very black and fissile, weathering into smooth fragments with sometimes almost a silvery luster. The basic igneous rocks, so abundant in the western belt, occur to a minor extent in the rocks of the Calaveras formation east of the Mariposa beds.

All of the limestone masses are more or less crystalline and fossils are very poorly preserved. In the limestone area, four miles southeast of Placerville, frequently occur crinoid stems which by their rounded forms indicate Paleozoic age.

The whole series up to the eastern margin has a steep easterly dip. Although differing in details the series is essentially similar in character throughout and might be described as the siliceous series. The strike of this siliceous series is north and northwest, except in the region southwest of Grizzly Flat, where the strike for a considerable distance is northeast. The change of strike appears to be due to the intrusion of the granodiorite.



SECTION OF MELTON MINE, EL DORADO CO.

Mariposa slates.—The Mariposa beds consist almost entirely of black slates not so much altered as those of the Calaveras formation. When fresh they are a deep black, but weathering changes them quickly to a light rusty brown. A little south of the Mile Hill toll-house in the northwest corner of the sheet appears a series of dark, partly volcanic sandstones and breccias, intercalated among the slates. This series continues up towards Colfax. It is well exposed along the canyon of the north fork of the American river, where it enters from the Colfax sheet adjoining at the north. The belt of the Mariposa slates contains numerous highly auriferous quartz veins. Ammonites and belemnites are found in these slates in El Dorado county. These fossils are similar to upper Jurassic forms of Europe. Another belt of Mariposa slates occurs in the lower foothills, extending southeast from Folsom. There are small patches belonging to this belt on the southwest corner of the sheet. The quartz veins in this western belt seldom contain gold in paying quantities.

IGNEOUS ROCKS.

Diabase and amphibolite-schist. — In the Carboniferous of the northwestern corner of the sheet are numerous dike-like masses of a fine grained dark green diabase usually partly or wholly uralitized (that is, with the pyroxene converted into hornblende).

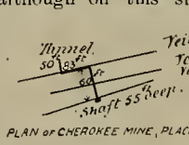
The amphibolites of the large area near the western margin of the sheet are dark green rocks, medium to fine grained, sometimes consisting almost entirely of amphibole, and are usually distinctly schistose with steep eastern dip. A part of them, especially north of Latrobe, are quite coarse grained. Although the larger part of them have been derived from diabase, it is not improbable that in many cases the original rock was gabbro. The two areas of light colored amphibole and talc rocks crossed by the road from Oleta to Bridgeport were probably pyroxenite originally. Some specimens contain pyroxene altering to tremolite and serpentine.

The long dike of diabase which follows the western contact between the western belt of the Calaveras formation and the Mariposa slates is quite variable in composition; the southern part, up to the granodiorite area of Coloma, is principally composed of a massive, dark green diabase-breccia; while to the north of this area of granodiorite it is roughly schistose and consists partly of massive dark green diabase and diabase-porphyrite with large white feldspar crystals, and partly of breccia of varying fineness made up of these rocks. The large area of amphibolite-schist north of Greenwood which is inclosed in the black Mesozoic slates is derived from diabase and diabase-porphyrite by dynamometamorphism, that is, metamorphism induced by intense pressure and movement. Near Greenwood there is altered diabase-porphyrite going over into normal amphibolite-schist. The Mesozoic slates contain a great number of similar smaller streaks and masses of amphibolitic rocks.

Gabbro-diorite.—West of Shingle Springs occurs an area of coarse grained gabbro, the pyroxene in which is partly converted into uralite; it is a compact and hard rock presenting great resistance to weathering. Large parts of this area are occupied by rough and rocky hills covered with grease wood (*Adenostoma*). Along the contacts with the amphibolite it is plain that the gabbro-diorite is the younger rock and intrusive in the former.

Serpentine, pyroxenite, peridotite, gabbro and garnet-pyroxene rock.—The Carboniferous slates north of Coloma contain several areas of serpentine in many places immediately mixed with amphibolite-schists. Smaller masses of pyroxenite and peridotite occur in them, and from these rocks the serpentine has probably been derived. The Coloma area of granodiorite cuts off the serpentine masses in the same manner as it has cut off the diabase dike near Placerville. South of that area the serpentine continues as lenticular and dike-shaped masses in the amphibolite with which it is intimately connected; so much so, indeed, that frequently it is difficult to outline the areas. East of Shingle Springs the serpentine contains small masses of a dark colored gabbro as well as a dike of quartz-porphyrite. A small mass of garnet-pyroxene rock occurs four miles southeast of Latrobe.

The large dike in the slates of the Calaveras formation entering the Placerville sheet near Volcanoville is in many respects interesting and complex. It is usually referred to as the "serpentine belt," and is continuous for about forty miles north of this sheet. The primary rock of this dike varies from gabbro or diorite to pyroxenite and peridotite, although on this sheet no considerable areas of either of the two latter rocks are present. Masses of serpentine and amphibolite-schist, often very difficult to separate from the gabbro, occur at frequent intervals along the belt. Both must be considered as alteration products of the rocks mentioned above. Near the mouth of Rock creek on the south fork of the American river the dike is cut off by granodiorite; south of that area it appears again somewhat narrower and principally composed of serpentine, although along with it occur small masses of peridotite and gabbro. The serpentine area that lies just southwest of Bridgeport may perhaps be considered as part of this serpentine belt.



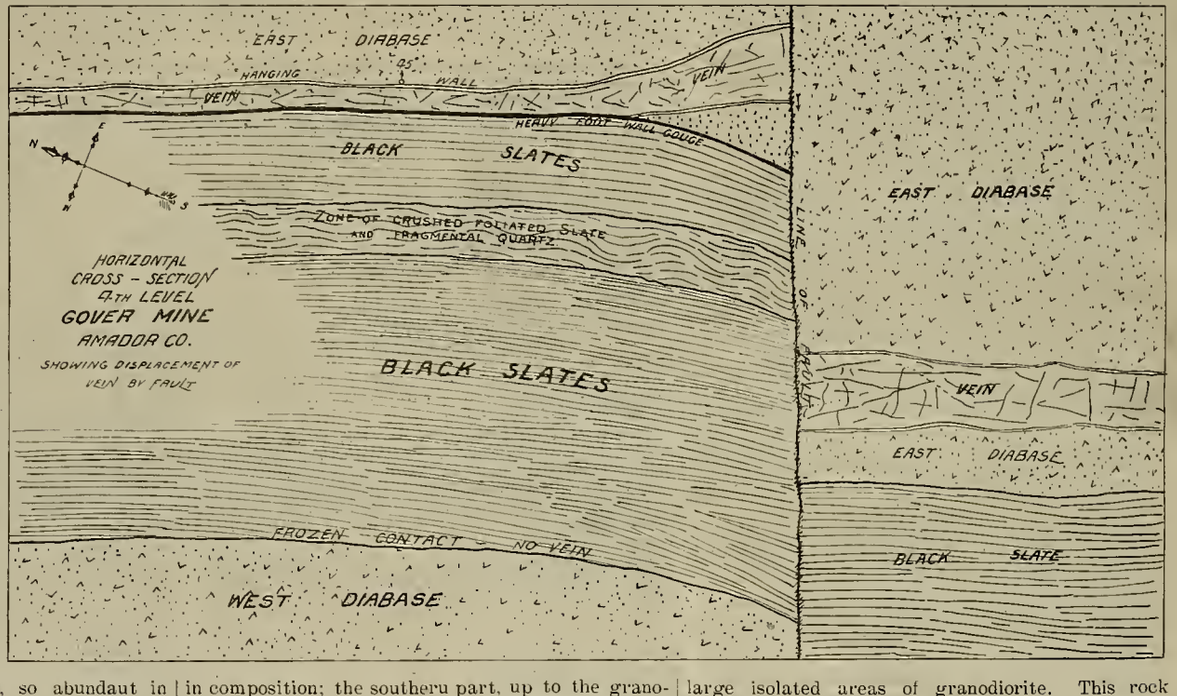
PLAN OF CHEROKEE MINE, PLACER CO.

Granodiorite, quartz-porphyrite and hornblende-porphyrite.—Intrusive in the slates of the Calaveras formation on the eastern part of the sheet are several large isolated areas of granodiorite. This rock usually metamorphoses the surrounding slates into micaceous and quartzite schists; the width of the contact zone varies from several hundred feet up to three-quarters of a mile, or in some cases even more; near Grizzly Flat the contact metamorphics frequently carry andalusite. At Grizzly Flat there are near the granodiorite contact small masses of a gabbroitic rock going over into granodiorite. The Coloma area of granodiorite is similar to the others in most respects, except that in some places the black mica is absent, and it has a tendency to grade into quartz-porphyrite. There is without doubt a gradual transition between the two rocks, as shown in the long projecting offshoots or apophyses at the southern end of the area.

PLAN OF FLAT RAVINE MINE, PLACER CO.

The quartz-porphyrite is a light-colored rock with porphyritic feldspars and quartz crystals in a groundmass of grayish or greenish color and of somewhat variable texture, though it is usually fine grained. The quartz-porphyrite, as well as the granodiorite, here contains much more sodium than potassium.

Closely connected with the granodiorite is the hornblende-porphyrite; it is a medium-grained rock with porphyritic feldspars and hornblendes in a groundmass of the same composition. It occurs at several places along the contacts, going over into



normal granodiorite; it also occurs as dikes and isolated massifs in the serpentines and other rocks in the vicinity. The hornblende-porphyrite massifs and dikes of Big Sugar Loaf and vicinity in places contain augite and grade into rocks of the diabase series containing no hornblende.

NEOCENE.

Auriferous gravels.—During the Neocene period the general topography of this sheet was that of a sloping table land, relieved by hills of moderate elevation. This area was drained by two river systems, one more or less closely corresponding to the forks of the present American river, and the other representing the branches of the Cosumnes. The gravels accumulated in them are now largely covered by volcanic material. The general direction of the Neocene drainage was as follows:

The old channel of the south fork of the American river enters the eastern margin of the sheet north of Pacific House and, crossing over, passes under the lava flow at Pacific House; from there it runs under the masses of Neocene andesite for about ten miles in a west-southwest direction down to a point between the two forks of Webber creek, northeast of Newtown; crossing the south fork of Webber creek it follows the present course of that creek for a considerable distance. The center of the old channel is here eroded, but there are numerous benches remaining to indicate its approximate course. In the vicinity of Placerville there is a complicated system of channels running south or southwest and tributary to the main fork. From a point between Placerville and Diamond Springs the channel was cut in a northwesterly direction, touching Granite Hill and entering the Sacramento sheet near Pilot Hill.

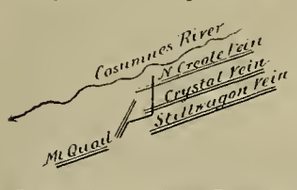
In Neocene time, the north fork of the American river followed a course which is now represented for a short distance by the divide north of Long canyon. The old channel again enters the sheet under the volcanic flow somewhere west of Todd valley and emerges from beneath the southern end of the volcanic area. Its course below this point is somewhat uncertain, but must have followed the present canyon of the middle fork pretty closely. Tributary to this former course are the Neocene channels north of Georgetown and between Volcanoville and Kentucky Flat. These tributaries flowed in a general north and northwest direction. In Neocene time, as now, the Georgetown divide formed a ridge between the two forks.

The course followed by the Cosumnes during the Neocene period is not perfectly known. It is certain, however, that one of the Neocene branches corresponding to the present Cosumnes headed near Grizzly Flat, and, flowing in a southwesterly direction across the present drainage, passed Henry diggings, Omo House and Indian diggings.

The auriferous gravels in this sheet consist of strata of quartzose and metamorphic gravel resting on the bedrock and usually overlain by finer sediments, such as clay and sand. The maximum thickness is not more than one hundred feet; usually it is much less.

The accumulation of auriferous gravels probably went on throughout the Tertiary, and may have begun even earlier.

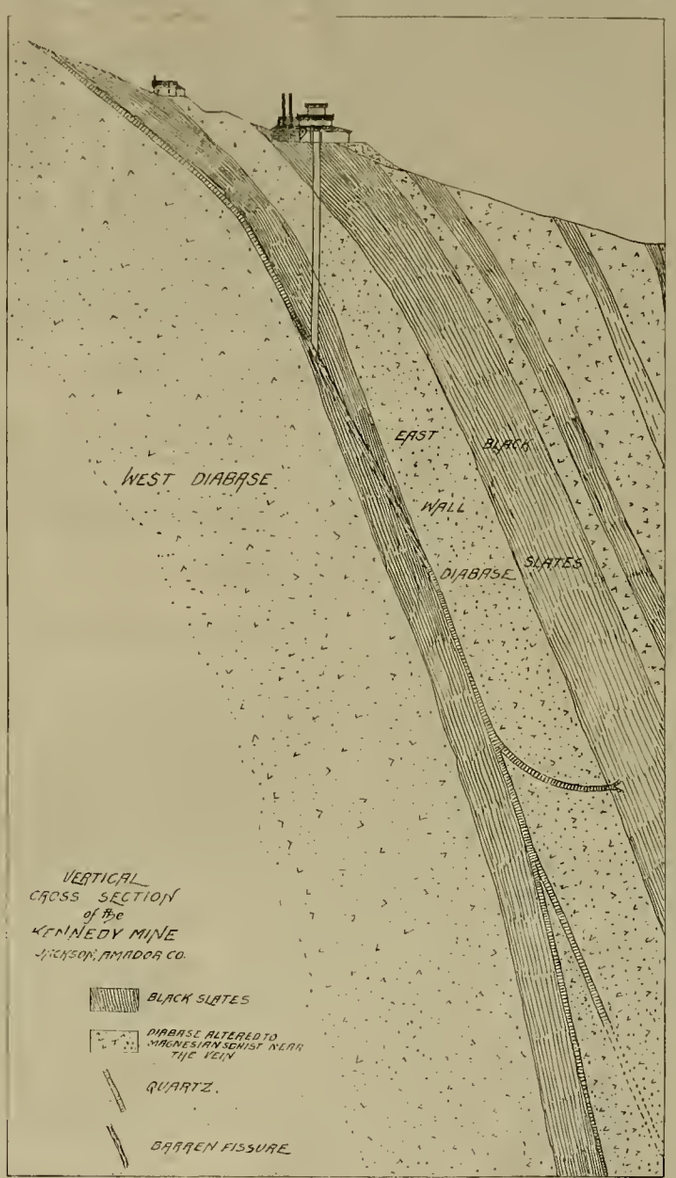
Rhyolitic beds.—The first volcanic flows which during the Neocene period came down from the slopes of the Sierra from the volcanoes uear the summit were rhyolitic iu character. The rhyolitic beds directly overlie the auriferous gravels and are composed of white or light-colored tuff usually fiue grained and occasionally containing scales of black mica. This volcanic fragmentary material doubtless came down in the form of many successive mud flows. Intercalated in the tuffs are beds of quartzose and metamorphic gravel and of light-colored clays and sands partly of volcanic origin. The gravels are usually somewhat auriferous. The total thickness of the rhyolitic beds is about 300 feet on the divide north of Long canyon and 400 feet in the vicinity of Newtown. Unlike the subsequent volcanic flows, the rhyolite did not spread over large areas, but only filled the valleys of the principal streams. During the interval between the rhyolitic and the subsequent andesitic eruption the former beds were considerably eroded and in places new channels were worn down to the bedrock. These, usually referred to as "cement channels," occur both north of the middle fork of the American river and in the vicinityof Placerville; in them the andesitic breccia ordinarily rests directly on shallow but rich gravel.



PLAN OF CRYSTAL MINE, ELDORADO CO.

Andesite.—The andesitic eruptions in the high Sierra flooded the larger part of the lower slopes with volcanic mud. Substantially the whole of the area of the Placerville sheet must have been thus covered, excepting the high bedrock ridges of the Slate mountains and, probably, the hills in the southwestern corner.

The andesitic beds, which are entirely fragmental in character, attain a maximum thickness of 700 feet on the divide north of Long canyon; in the vicinity of Placerville the thickness does not exceed 400 feet, while east of Placerville it again increases to 700. The lower part consists of heavy volcanic gravel, frequently somewhat auriferous, together with volcanic sands and tuffs; the upper part consists of a hard andesitic breccia and usually contains angular or subangular boulders of andesite often more than a foot in diameter. The andesite is dark gray to dark brown and contains porphyritic crystals of pyroxene and hornblende, the latter slightly prevailing; the cement uniting the boulders is light gray to light brown and consists of finely comminuted volcanic material. Nearly all of this rock has the rough and porous character which has been called asperitic.



PLEISTOCENE.

Earlier Pleistocene.—Along the rivers, and especially in the vicinity of Coloma, there are patches of gravel, from twenty to sixty feet above the present channel, which have been referred to the earlier Pleistocene. Along their upper courses below the limit of glaciation the canyons of the rivers usually are so narrow and steep that there is no room for these deposits.

Moraines resulting from Pleistocene glaciers are found in the extreme northeastern corner of the sheet. The morainal deposit here consists of a thin layer of angular fragments of granite and other rocks covering the surface of the Neocene volcauic flows, and partly the slopes of the canyons.

Alluvium.—There is but little alluvium on the Placerville sheet. Very shallow alluvial soil covers some of the valleys of the platcaus.

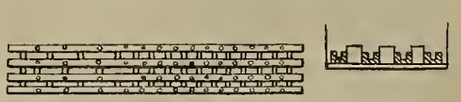
Gold-bearing gravels.—J. W. Marshall's discovery of gold in 1848 was made at Coloma, on this sheet. The alluvial accumulations of gold-bearing gravels in the preseut rivers and creeks were the first deposits worked. They were soon exhausted and the attention of the miners was turned to the gold in older deposits. A few bars along the American and Cosumnes rivers are still washed. The Pleistocene gravel benches along the present rivers have been and are now in part worked by sluicing and hydraulic mining. The hydraulic process is applied to the Tertiary auriferous gravels near Todd valley, on the divide north of Long cauyon, near Placerville and Newtown, aud at several places in the neighborhood of Georgetown, as well as at Mendon, Henry diggings and Indian diggings. The largest part of these gravels is, however, covered by volcanic flows, and is usually mined by drifting along the bedrock. Drift mines are at present worked in several places near Placerville, and also near Indian diggings.

Gold-quartz veins.—By far the most important mines on the Placerville sheet are located along the so-called mother lode in the area of the Mariposa slates, traversing the sheet from north to south. The mother lode, which must not be considered as a continuous vein, but rather as a belt of parallel though sometimes interrupted quartz-filled fissures, can be traced coutinuously as far north as the St. Lawrence mine on the Georgetown divide, and along it are found many celebrated mines, such as the Church Union, the Pacific and the Gopher-Boulder. The veins run parallel to the strike of the slates or cut them at a very acute augle. The dip is nearly always to the east and usually at a somewhat less steep augle than that of the surrounding slates. Along the veins of the mother lode frequently run narrow streaks of amphibolite-schist and serpentinc. The eastward bend in the strata caused by the intrusive granodiorite in the vicinity of Placerville is closely followed by the veins.

North of the St. Lawrence mine the mother lode is not well defined. The quartz veins are more frequently interrupted and are replaced by a peculiar kind of deposit, the seam diggings. In these a certain belt of slate is impregnated with minute irregular quartz veins, frequently very rich in gold. Such seam diggings occur at Georgia Slide, Spanish Dry Diggings, Greenwood, and other places. From the St. Lawrence one branch of auriferous quartz deposits runs up towards Georgetown aud Georgia Slide. Another belt begins by the Esperanza mine, north of the St. Lawrence, and continues with frequeut interruptions to the Sliger vein and Oregon bar, both on the middle fork of the American river. The quartz mines near Butcher ranch, and the seam diggings in Codfish canyon ou the north side of the north fork of the American river, may be cousidered as belonging to the same belt, but it is uot possible to trace the auriferous veins of the mother lode further.

On both sides of the great serpentine belt running from Volcanoville to the Cosumnes granodiorite area there are near the contact numerous small quartz veins, very rich in scattered bunches and pockets of gold. Few permanent mines are found, however, along these contacts.

The only important mining district in the eastern part of the sheet is that of Grizzly Flat. A long stretch of the contact of slates and granodiorite, from the middle fork of the Cosumnes to the "Buttes," is mineralized and accompanied by a great mauy auriferous quartz veins, the most prominent of which is that of the Mount Pleasant mine.


RIFFLE USED AT LINDEN MINE, ELDORADO CO.

Copper deposits.—Copper ores are found in very few places on the Placerville sheet, and nowhere in any considerable quantity. They occur as vein deposits aloug the grauodiorite in the zone of contact metamorphics, and one prospect lies south of Deer creek in the amphibolite-schist. Small masses of copper pyrites occur in serpeutine and amphibolite about two miles west of Greenwood.

Quicksilver deposits.—Quicksilver was formerly mined near Fanny creek, south of Big Sugar Loaf. Traces of cinnabar are said to occur near the mouth

of Hastings creek and in Clark's creek ravine one mile north from its mouth.

Chrome iron.—Deposits of chrome iron occur in California only in serpentine. On the sheet showing the economic geology two deposits are noted. Along the area described above as the "serpentine belt" many small pockets have been found.

Building-stones.—When massive, the granodiorite makes very good building-stone and is used in many places. Certain kinds of more massive rhyolitic tuffs, found at Smith's Flat and other places near Placerville, make a most excellent and easily dressed building-stone.

Black clay roofing slates are quarried at Chili bar, four miles north of Placerville, in the canyon of the south fork of the American river. There are at present several quarries, and the slate, which is of excellent quality, is used in many places in California. Good roofing slate could doubtless be obtained at other points in the Mariposa beds.

Militating against the development of the quarry industry is the lack of cheap transportation.

Personal.

CHAS. G. YALE, who has been seriously ill, is convalescent.

P. ROTHERMEL has returned from a visit to Shasta Co. mines in which he is interested.

P. R. ROBERTS has been appointed superintendent of the North Star mine, Nevada Co.

W. N. CROMWELL succeeds Jas. McNaught as counsel for the receivers of the N. P. R. R.

J. V. KEELEY, owner of the Clementina mine, Yellow Pine district, Santa Barbara Co., is in the city.

J. H. TIBBITS, a mining man of Amador Co., has gone to Arizona to take charge of a mine in Pinal Co.

FRED ZEITLER, superintendent of the Champion mine, has recovered from his recent illness, and is again at work.

W. B. MIDDLETON is examining mining property in the interest of Denver capitalists, in Robinsonville district, Baker Co., Oregon.

W. DE L. BENEDICT, a civil and mining engineer of New York City, and member of the American Institute of Mining Engineers, arrived here yesterday.

J. T. SMITH is inspecting Oroville mining properties in the interest of English capital. He has been examining some promising properties in the vicinity of Placerville during the week.

CAPT. WILLIAMS, for many years superintendent of the New Idria quicksilver mines in the southern part of San Benito Co., has resigned. Mr. E. G. Holmes is his successor as resident superintendent.

DR. R. BEVERLY COLE, of this city, has been honored by election to the Presidency of the American Medical Association, the first physician in this State to receive that distinction, since Dr. Logan of Sacramento was elected in 1870.

IRVING M. SCOTT delivered a lecture at Sacramento last Wednesday night under the auspices of the Capital City Lecture Association on "Great Guns and Armor Plates," which was heard with attention and interest by a large and appreciative audience.

W. H. TURNER, of Sutter Creek, goes to Johanneshurg, South Africa, next month, as mill man for one of the big mining companies on the Randt. His salary is to he $3,000 a year, transportation and living expenses. He was formerly superintendent of the Treadwell, Alaska, mine, and superintended mining operations for many years in Mexico.

G. H. ROBINSON, whose contract as manager of the Mammoth properties in Tintic, Utah, expired April 1st, is general manager of all the mining interests of J. R. DeLamar, with headquarters in Salt Lake. The interests under the control of Mr. Robinson include the DeLamar properties in Creede, Colo., the mine and mill in the Ferguson district, Nevada, the Golden Gate group in Mercur, Utah, and other concerns operating in Utah and Nevada under bond.

JOHN LEWIS KINGMAN has been appointed chief engineer of the Mexican Central, with headquarters at the City of Mexico. He was chief engineer of the Chihuahua division of the road during its construction, and was formerly chief engineer of the western division of the Atlantic & Pacific. He was assistant engineer of the Southern Pacific from July, 1868, to October, 1871; assistant engineer of the Kansas Pacific from October, 1871, to July, 1877, and assistant and locating engineer of the Atchison, Topeka & Santa Fe from July, 1877, to February, 1880. He was then with the Atlantic & Pacific until he was appointed chief engineer of the Chihuahua division of the Mexican Central in 1883.

COL. WILLIAM PRICE CRAIGHILL succeeds Gen. Casey as chief officer of the U. S. Corps of Civil Engineers. He was horn at Charlestown, Va., July 1, 1833. In 1849 he was appointed to West Point, and graduated second in a class of fifty-two members in 1853. During the war he received the brevets of Lieutenant-Colonel and Colonel for meritorious services. He was assistant professor of military and civil engineering at West Point for four years, from 1856 to 1859, and again, from 1866 to 1870, was on duty in the engineer hureau. He has been sent to Europe twice on engineering missions, and has visited this coast five or six times. He is familiar with the wants of the country in military fortification, harhor improvements and other general engineering projects. It was supposed Col. Mendell would he tendered the position, hut as he will be entitled to retirement on Octoher 1 the President appointed Col. Price.

W. C. RALSTON, the Secretary of the California Miners' Association, returned this week from a six months' sojourn in London and Paris, where he was a witness of the present extraordiuary activity in South African mining shares in those cities. He says that the published accounts of the craze are not exaggerations; that more zeal than judgment is disolayed in the investment of millions of pounds sterling, and that, indirectly, the inevitahle collapse will make it easier to direct the attention of the English seeker after legitimate miniug investments to the superior permanent nature of our California gold properties. Upon his arrival at New York he was interviewed by the New York *Herald* on the subject of mineral lands, which, in the issue of April 28th, gave a two-column illustrated statement of the facts in the case wherein the commonwealth of California, through its miners, is resisting corporation efforts to ahsorh large areas of the public domain. In compliance with telegraphed suggestions from this oity, he went to Washington, where he put the case fairly and squarely before every one at the seat of tbe federal Government by extended interviews, published in Washington's leading journal.

Coast Industrial Notes.

—The British patrol fleet will be shortly withdrawn from Bering sea.

—Judging from the present demand, a California bicycle factory should pay well.

—At Chino there has already heen planted this season nearly 4000 acres to sugar beets.

—The Western Sugar Refinery has advanced the price of granulated sugar one-eighth of a cent three times within a week.

—Woodbury concentrators are heing sent to Idaho and Utah. Hendrie & Bolthoff of Denver are the Colorado agents.

—According to the Phœnix *Gazette*, the Southern Pacific Railroad is about to commence work on its Mesa City extension.

—Up to date 4000 carloads of oranges have heen shipped East from southern California and about 1300 carloads still remain on the trees.

—A large spur wheel, weighing 6300 pounds, was cast at the Miners' Foundry, Nevada City, this week, for the Federal Loan Mining Company.

—A Phœnix, Arizona, manufacturer makes affidavit to the fact that, on an importation of rosin tbat had cost him $160 in the East, he paid $720 freight.

—The old hoilers of the steamship Columbia, which have heen replaced hy new ones at the Union Iron Works, are being broken into scrap iron, worth $3.50 a ton.

—Orders were recently received from Moscow, Russia, and Warsaw, Poland, for a earload of Sierra Nevada redwood, to he used in the manufacture of lead pencils.

—The San Francisco Gaslight Co. has cut the price from $2.00 to $1.75 per M. feet. A reduction is also announced for gas used in gas engines and for manufacturing purposes.

—The Stanislaus and San Joaquin Canal Co. are building a ditch forty-seven feet wide from Knight's Ferry to Lathrop—50 miles. Nearly 300 men are working day and night on the job.

—The Northern Pacific railroad has prepared a revised schedule of wages, which will soon go into effect. It embraces the entire system and adjusts inequalities of former reductions.

—The Southern Pacific Co.'s net earnings for '94 were $16,050,949: for '93 the net earnings were $18,158,790. The total earnings for the year above all fixed charges and liabilities were $2,139,184.

—Portland, Or., is going to try the experiment of canning horse flesh. Horse meat as an article of food is not new to the people of Oregon. The old missionaries from 1833 to 1844 used it as a regular diet.

—Tbe Spring Valley Water Company are now building a tunnel from the Colma district about Lake Merced to the Pacific ocean to carry off all drainage water and keep the lake pure. It will cost $150,000.

—The prohibition of machinery from China may end by the results of the Japanese war, and American manufactures have a new market—a probability of immense importanee to the industrial interests of this coast.

—A new oil well at Puente produces sixty barrels daily. Another one recently put down yields fifty barrels, while from the largest well 120 barrels are pumped daily. Thirty wells are now operated aud others are heing bored.

—The Fresno owners of the new water and electric power plant heing put in on the San Joaquin river have offered to furnish power for machine shops of the S. F. and S. J. Valley Road if built there at one-half the price of steam power.

—L. B. Frazier, near Ukiah, is experimenting with a project which, if successful, means much to Mendocino county. He has huilt a kiln and proposes to make tar, turpentine and by-products from the unlimited pine forests of that region.

—Some experienced paper mill men, who have heen connected with the Oregon City, Or., mills, propose putting in a $150,000 plant at Green Basin, on the eastern division of the Oregon Pacific railroad, to make wood pulp from hemlock timber, which is abundant there.

—The Arizona Marble Company, whose deposits of marble lie across the Cochise county line, in Pima county, have sold to a syndicate of Colorado capitalists 500 carloads of marble to be delivered as fast as practicahle. This marble is to he used for building purposes, floors, etc., in Colorado's finest buildings.

—During the flood of 1894 ahout twenty-three fishwheels were washed out in the Columhia near The Dalles, Oregon, at a loss of $80,000 to the owners. When the season opened on the 10th of last month every wheel had been replaced. Last season there was a phenomenal run of salmon. This year it is not expected to he so large.

—Besides the deplorahle fatality, seventeen men having perished, the loss of the schooner C. G. White has heen a hlow to the furriers. After much difficulty Leihes & Co. obtained permission to hunt otters in Bering sea, which was prohihited hy this Government for several years. The White had on board fifty otter skins valued at $20,000.

—California imports condensed milk by the trainload. A large share of this product is used hy California farmers. There is no country in the world where milk can he produced so ahundantly, cheaply or continuously as here, hut we keep right along huying condensed milk, and the pile of empty cans back of the farmers' houses keeps getting larger.

—The right of way for the 56 miles of proposed railway hetween Astoria and Goble, Or., along the south bank of the Columbia river, has heen secured. There will be three tunnels on the road, one of 200 feet in length and one helow Ranier of 175 feet. Work can he pushed at hoth ends of the tunnel, and it can he completed in eight or ten months.

—It is now thought that the sale of $196,000 worth of Los Angeles refunding honds to Street, Wykes & Co. of New York for a premium of $20,000 may have to he canceled on account of a law which went into effect on March 27th, providing that in the case of refunding bonds the original holders of the bonds shall have the first opportunity to purchase them.

—L. Grothwell of this city proposes to run an electric road from Napa north to Calistoga, twenty-seven miles. He also proposes to huild to Napa Soda Springs and the asylum and cover Napa with electric lines. He estimates the cost of the proposed work at $400,000. The road to Calistoga would parallel the Southern Pacific Company's road the entire distance.

—The Golden State and Miners' Iron Works, of this city, have an order from Harris & Witter for a mammoth clamshell dredger for the isthmus; the hull is to he 50x100 feet, 10 feet depth of hold; the engines tandem compound condensing, spuds seventy feet long and twenty-five inches diameter, the bucket to hold four yards and he operated hy 1¼-in. steel cable. An electric plant will furnish light, and the entire outfit will cost $36,000.

—There has been submitted to the Mexican Congress for approval a contract between the Mexican Government and Samuel Brothers, of the City of Mexico, for the supply of $2,000,000 worth of rolling stock, bridges, and machinery for shops, etc., for the Tehuantepec railway; dredges, tugs and lighters for the harhors, and steamships for lighthouse purposes. Samuel Brothers are also negotiating for the construction of the harbors of Coatzacoalcos and Salina Cruiz, on the Atlantic and Pacific extremities of the Tehuantepec road.

—Seattle, Wash., has given a $500,000 subsidy to the Seattle and Lake Washington Waterway Company to fill in the tide flats and excavate a ship canal to Lake Washington. Work will hegin on the 23rd. It includes excavation of two waterways, connecting the Duwamish river with the souud, the excavation of a canal from the harhor to Lake Washington, a distance of two miles, and the filling of ahout 1500 acres of tide lands. It will cost ahout $7,000,000 aud occupy about five years; the money will be furnished by St. Louis parties, represented by the Mississippi Valley Trust Company.

—Two extensions of the Washington & Columbia River Railroad are contemplated. One plan is to build from Daytou, Wash., to Grain City on Smoke river, tapping a productive country. Another plan is to construct a new line from Pendleton, Or., to Camas Prairie and the John Day region, involving eventually construction through to California, coming into this State at the head of the Sacramento valley, with San Francisco as the objective point. The latter line will run through Umatilla, Grant, Harney and Lake counties in Oregon and enter this State at the northern horder of Modoc county.

—The iron ship May Flint is due next month with 5000 tons of coal from Baltimore. She spreads 10,000 square yards of canvas and is the largest sailing vessel afloat. She has four steel masts, and from the keel to the topmost point of each mast is 184 feet. The masts from deck to truck measure 159 feet. The fore, main and crossjack yards are each 93 feet, the howspirt and jihhoom 40 feet, and spanker hoom 56 feet. The masts are hollow and 30 inches across at the deck. The ship will carry 30 sails, or enough canvas to make an awning a mile square. The few sailing vessels that approach the May Flint in size are the French five-masted steel hark France, 3624 tons; the British four-mast ship Liverpool, 3330 tons, and the American four-masted ships Roanoke and Shenandoah, 3400 and 3258 tons respectively. The May Flint is 3923 tons.

—The most important results of the Japanese-Chinese war that has just ended will he found not in the money indemnity that China will pay nor the territory it will cede to its victorious antagonist. These results will come in the industrial revolution which China will receive from its conqueror. In this China will gain far more than it has lost, while the Japanese as leaders in the new civilization will achieve greater triumphs than any which war affords. The opening of the Chinese Empire to the arts and industries of a higher civilization is an event of interest and importance to California and the Pacific coast. The manufacturing nations of Europe, especially England, will look on this movement with little favor; but it is wholly heyond their power to prevent it. The first result will he an enlarged demand for lumber, the next a market opened for mining, milling, manufacturing and agricultural machinery.

—Mr. T. G. Cantrell of the National Iron Works, heing recently asked for his opinion as to how hest add to the State's population, said: "Causes must he created to produce a desired effect. The natural tendency of people is to go where they can find remuneration for their labor. In the early history of the State, gold mining was the primary cause for inducing immigration. The same industry to-day, if pursued legitimately, would draw more people to the State, and, through the demand for necessary machinery, supplies, etc., create renewed activity in Sau Francisco's husiness community, and in consequence invite new-comers. The world suffers from overproduction in everything but gold, and California possesses the precious metal in greater quantities and with more advantageous facilities for its extraction than any other part of the country. Let it he known that capital takes no greater risk in mining than in other enterprises, with promise of a hetter profit than can he realized from any other investment at the present time. Encourage an industry that invites seekers after wealth, and people will flock here instead of going to Africa, Australia or Alaska. By a revival of the legitimate mining interest, there will he no more trouble in getting 500,000 people in San Francisco than when it was discovered that gold was to he found here forty years ago."

Obituary.

J. H. SEELLY, president of Amherst College, died there last Sunday in the 71st year of his age.

H. H. COTTON, an old and well-known miner, was instantly killed last Thursday hy a cave in the Malakoff mine near North Bloomfield, Nevada county.

SUPERINTENDENT J. F. LEMON, of the New Carmine mine in the State of Chihuahua, Mexico, and two other Americans, were killed recently hy Mexicans. The cause of the murder is as yet unknown.

DR. JAY GUY LEWIS, a well known mining man, died at his home in Sparta, Oregon, last Sunday, after a brief illness, of erysipelas. Dr. Lewis was superintendent of Oregon's exhibit at the World's Fair.

FRANKLIN FAIRBANKS died at his home in St. Johusbury, Vt., April 24, 1895, in his 67th year. He was the youngest of four sons of Erastus Fairhanks, Governor of Vermont, and founder of the famous scale works to which he gave his name. He lived all his life and died in his native town.

ECKLEY B. COXE died at Hazleton, Pa., last Monday, aged 65 years. He graduated at the University of Pennsylvania in 1858. After six months in the anthracite coal region of Pennsylvania, he engaged in topographical geology, and went ahroad in 1860. Two years were passed at the Ecole des Mines in Paris, and a year in the Freiberg mining school, after which he continued for nearly two years studying the mines in England and continental Europe. As an expert on the mining and preparation of anthracite coal, and on the subject of mine surveying, Mr. Coxe frequently lectured before scientific hodies. He was prominent in the American Institute of Mining Engineers, heing its president from May, 1878, until February, 1880; also, in the Institute of Mechanical Engineers, of which he was vice-president from April, 1880, until November, 1881; and he was a memher of the American Society of Civil Engineers. He published papers on technical subjects, chiefly in the transactions of the societies of which he was a memher, and translated the first volume of the fourth edition of Weishhach's "Mechanics of Engineering and Construction of Machines." From 1880 until 1884 he was a State Senator in Pennsylvania.

J. L. STEWART, of Philadelphia, is here and talks of building fifteen gas works in as many different coast cities. He thinks the charges in San Francisco for gas are unnecessarily high; the two gas companies charge $2 a thousand feet. He says he can furnish it for $1 a thousand and then make money. He estimates that the new plant here, with the mains requisite, will cost $3,000,000. With gas at $1 a thousand feet it would be as cheap as coal at $7 a ton.

Notes on Recent Compressed Air Plants.

To the Editor.—The Fulton Engineering and Ship-Building Works of this city are at present extensively occupied in the manufacture of specially high-class compressed air plants for different enterprises in this State.

It is now less than a year since this company began to make air transmission one of their specialties, and yet they have in the course of construction the three most distinctive compressed air plants ever put in the State, besides a number of smaller ones which are not specially interesting in their nature.

The largest plant, viz., the 700-horse power plant to operate the pneumatic guns at the Presidio, has already been touched upon in a former communication. This plant is nearly finished and in the course of the next thirty days will be tested. In appearance it even exceeds the anticipations of its designers, and scientific results are expected from this test.

The most interesting plant to miners in this State is that for the North Star Mining Co., of Grass Valley. This company proposes to inaugurate 800-horse power for the operation of the various engines and motors connected with the mines in their charge. The first plant of 250-horse power is now under course of construction by the Fulton Company.

The North Star Company, during the last six months, have been investigating the comparative methods of electrical and compressed air transmission, and for their work have decided in favor of the latter. A steel pipe, of twenty inches in diameter and something over a mile long, conveys the power water, under a pressure of 775 feet, down to Wolf creek in the town of Grass Valley. Directly on the creek will be erected a stone power-house and distributing manifolds for the three plants, the first of which is at present being installed.

About 125 feet vertically above the power-house, and 1500 feet distant, will be located the hoisting works and machinery first to be operated by this plant.

In the design and construction of this plant it has been the endeavor to make it the most economical water power compressed air plant ever made. The type of the water wheel has not yet been selected, but it will be either the Knight or the Pelton wheel, depending upon some tests which are now being made. The wheel will be placed directly upon the shaft, and be about nineteen feet in diameter.

The compressors will be of the duplex Rix tandem compound type, having submerged copper intercoolers of large extent. The cylinders of these compressors will be so connected that any cylinder or half of any cylinder can be operated independently of the whole system. The water wheel will make 110 revolutions, and the regulating devices will be such as to maintain this speed and to operate the wheel at one-fourth, one-half, three-fourths and full gate economically.

The air will be conducted from the compressor to the mine in a large main and will there pass through a reheater of peculiar and special design. In this reheater the air will be heated to between 200° and 300° F., increasing its volume about 35%; and thence directly to the hoisting engines, and through carefully insulated pipes to pumping engines some three or four hundred feet below the surface.

In comparing this plant with electrical transmission, it is expected that the economy will be vastly superior. There is no doubt that in comparing these two modes of transmission, for short distances, electricity is vastly inferior in economy, and for the following reasons: The water wheel will of course give the same efficiency in either case; the dynamo will give an efficiency not to exceed that of a compound compressor built in the style of the Rix compressors. Allowing for short distances, the electrical transmission on the wire will suffer no more loss than compressed air in a good-sized pipe; thus one can see that the same power will arrive at the motors in either case. At this point there is no means of increasing the quantity or the pressure of the electrical force and it must go to its motor as it stands, while with compressed air, at an expenditure of not more than one-quarter of a pound of coke per horse power per hour, which is insignificant, the volume may be increased 35% and used at once in the motors. This places the net efficiency far higher than can be expected in electrical transmission.

This is the first reheating plant placed in a mine in this State, and possibly of this nature in the United States. The principle of the system is that employed in the large power transmissions of Paris and of Birmingham, Eng., and which have demonstrated that compressed air power is the cheapest yet served from any power station that has to purchase its fuel for prime movers.

There is little doubt that the result of some experiments now being conducted under my supervision will show that air motors may be constructed in such a manner and of such material that air reheated to 500° may be successfully used. If this is the case the transmission losses would be done away with, and the original prime mover power can be used at the motors. In the use of compressed air in mines there need be no changes of any consequence in the ordinary steam motors and pumps, and therefore it entails a less expense in changes and alterations in its installment; and besides, the exhaust from an air motor is not offensive—in fact, it assists in purifying the air underground.

I think in the near future the advantages of compressed air transmission will be more generally acknowledged than at present, and that there is abundant opportunity in this State for its economical use.

The Fulton Company are also building a large compressed air plant for the Golden Cross Mining Company, consisting of eighteen-inch Rix compressors driven by condensing Corliss engines. This will make an economical plant, and all mines which have any regard for their wood pile should operate their compressed air machinery by economical engines. When this plant is in operation data will be furnished to the public, giving the amount of wood consumed per twenty-four hours for operating the rock drills driven by this plant, so that mine owners can make a comparison with the plants which they are now operating. Corliss engines now are very little more expensive than slide-valve engines and in running, condensing like this plant, the fuel bill will be at least 40% less. In a large plant this will pay for the difference of cost in a very short time.

The Fulton Company, as stated before, are making a specialty of this subject of compressed air transmission, and are guaranteeing economic results. Any one desiring information in the matter will receive full data upon addressing the company a communication. It is entirely probable that any ordinary compressed air transmission can be installed at no greater expense than an electrical one and with better economic results.

E. A. Rix.

San Francisco, May 15th, 1895.

The Genesis of Ore Deposits.

One of the most notable recent contributions to the science of economic geology, viewed from the theoretical standpoint, says the *Engineering Magazine*, is the criticism by Prof. Joseph Le Conte (offered at the Bridgeport meeting of the American Institute of Mining Engineers) on Bergrath F. Posepny's great essay on the genesis of ore deposits. This latter has elicited much interesting and some useful discussion. After doing justice to the high merits of Posepny's treatise, Prof. Le Coute "cannot but think that he (Posepny) carries his ascension views much too far; that, in his zeal against the extreme lateral-secretion views of Sandberger, he has gone to the other extreme of ascensionism, and that a truer view of either may be found in one that shall combine and reconcile these two extremes." It will be remembered that Posepny draws a sharp distinction between the superficial and the deep circulation of underground waters; the water in the former case containing air, and therefore oxidiziug; the water in the other case being destitute of air, and therefore non-oxidizing; the one circulation being driven by gravity alone, the direction of current being determined by the plane of outflow; the other being driven largely by heat received in the lower parts of its circuits, and the direction of its current being mainly upward—from which view it follows that metallic sulphides are not deposited from the waters of the "vadose" (superficial) circulation, unless under the exceptional conditions of the presence of excess of organic matter; and therefore that the presence of metals in the form of sulphides is usually a sign of deposit from ascending waters of the deeper non-oxidizing circulation. Posepny has also introduced, as a substitute for the indefinite "unknown depths" of other geologists, the term "barysphere" to define a region in the interior of the earth, the materials of which are heavier, because more metalliferous, than the superficial "lithosphere" visible to us. This "barysphere" would therefore be the source of ore deposits, and not the higher rocks; but Sandberger and his followers have demonstrated by defined analyses that these upper rocks, especially in their heavier basic mineral constituents, contain the metals in sufficient quantity to form ore deposits by leaching, concentration and precipitation.

Prof. Le Conte, inquiring whether there is a "barysphere" within reach of circulating water, admits (as all do) that there must be such a region somewhere, but doubts whether it is near enough to the surface. The mean density of the earth as a whole being about 5.5, while that of the surface rocks is about 2.5, he argues that, assuming the simplest rate of increase—a uniform one—the central density would be 14.5, and an actual density equal to the mean density would be found at a depth of 1000 miles. At a depth of 100 miles, therefore, the increase would be 0.3 and the density only 2.8; but that is only about the density of the more basic eruptives. But Prof. Le Conte does not believe it probable that circulating water ever comes up from any such depth. It may come, he thinks, from as deep as ten miles, where the increase over the superficial density would be wholly inappreciable. If the rate of increase is not uniform, on either explanation of the high mean density of the earth, whether (1) by condensation by increasing pressure or (2) arrangements of materials of a primal fused earth according to their relative specific gravities—the probability being in favor of both causes—at all events the increase must be progressive toward the center, and he thinks it hard to conceive the conditions under which a dense metalliferous shell a little way beneath the surface could be formed. From a chain of reasoning which cannot be followed here he concludes that below a certain moderate depth—say eight or ten miles—there is no true circulation. Below this the compactness of the rocks from increasing pressure would inhibit further penetration, while capillarity, which strongly impels movement in dry, porous materials, also acts as strongly to retard it, once the rocks become saturated.

Prof. Le Conte believes that a more comprehensive theory than the ascension or the lateral-secretion theories is needed, and that, in the uncolored light of a broader view, many of the difficulties and obscurities of the subject disappear. His general conclusions are:

"1. Ore deposits, using the term in its widest sense, may take place from many kinds of waters, but especially from alkaline solutions, for these are the natural solvents of metallic sulphides, and metallic sulphides are usually the original form of such deposits.

"2. They may take place from waters at any temperature and pressure, but mainly from those at high temperature and under heavy pressure, because, on account of their great solvent power, such waters are heavily freighted with metals.

"3. The depositing waters may be moving in any direction—up-coming, horizontally moving, or even sometimes down-going, but mainly up-coming, because by losing heat and pressure at every step such waters are sure to deposit abundantly." [This has been used by some as an argument that mines, as a general rule, increase in richness with depth—a state of things not substantiated by experience.]

"4. Deposits may take place in any kind of waterways—in open fissures, in incipient fissures, joints, cracks, and even in porous sandstone, but especially in great open fissures, because these are the main highways of ascending waters from the greatest depths.

"5. Deposits may be found in many regions and in many kinds of rocks, but mainly in mountain regions and in metamorphic and igneous rocks, because the thermosphere is nearer the surface, and ready access thereto through great fissures is found mostly in these regions and in these rocks."

The Oro Blanco Country.

Written by Don C. Pickett, Ex-Superintendent of the Quijotoa Mines.

The Oro Blanco range commences about sixty-five miles south of Tucson, Arizona, takes a southeasterly course through the southern part of Pima county and enters Sonora, Mexico, about nine miles south of the little town of Oro Blanco.

The altitude of the Oro Blanco country varies from 3000 to 4500 feet above sea level.

The general formation in and about the locality is porphyry, with some granite scattered throughout the hills and canyons. The Oro Blanco mining claim consists of a full sized claim, being 600 feet in width by 1500 in length. The strike of the vein is a little north of west and south of east.

As I followed the ledge over the surface, I found many traces of work done years ago, no doubt by Mexicans or Spaniards; and at one place, immediately west of the shaft, the entire vein had been taken out for the length of 150 feet, and to a depth of at least thirty feet. This work had been many years ago, and from the fact that I could find but very little traces of a "dump" on or about the mine, I could only conclude that the ore taken out had been worked to almost the last pound in the crude way peculiar to those early miners.

From inquiry made in regard to this work, I was reliably informed that at one time, some thirty-five years ago, there were forty-seven arrastras at work on this ground, and over 150 people lived on the proceeds taken from this ledge. In evidence of this, I looked for and found many traces of arrastras in the canyon and flat immediately below the work. That the ore taken out from this long deep cut paid well in gold is beyond question, else a whole community could not have existed upon the proceeds by their slow and crude methods. From the fact that no waste dump could be found in or about the canyon and flat where the arrastras had been located, or at the mine, it would appear that nearly every pound had been worked in some manner. The cut is filled to some depth by debris and wash from the hillside, carried down by the action of rain and storms, but the walls of the ledge stand firm and can be distinctly seen throughout the entire length of the excavation. I would say that at least 1500 tons of ore have been taken from this cut and other excavations along the ledge.

That the mine should have been abandoned by the Mexican owners of that time was something of a mystery to me, and I endeavored to find out the reason for its abandonment. From John Bartlett and R. N. Leatherwood I learned that in the early "sixties" about forty families lived in the canyon, and virtually gained their living by the gold produced from the Oro Blanco mine. Few white men lived in the country at the time, but the few who did live here concluded that if the mine was good

for the Mexicans it was good for them, so a number of them banded together and ran the Mexicans out, giving as a reason that they, the Mexicans, not being citizens of the United States, could not own and work mining claims within the limits of the United States.

The mine was then located and claimed by the head instigators of the outrage. While the arrastra process was sufficient to satisfy the slow-going Mexicans, it failed to satisfy the more ambitious Americans. A ton per week to the arrastra, together with the fact that while one man worked with the pick and shovel two must stand guard to protect the ore from Indians and wandering bands of criminal Mexicans, soon convinced them that they had acquired something they could not utilize, hence the mine was abandoned. It lay unclaimed for a number of years, and time, storms and Indians obliterated nearly every trace and habitation of the people that once lived and prospered on the proceeds of the mine.

In later years silver mining took up the time and attention of most of the miners of this country, and gold ores of $15 to $20 per ton were passed over by miners in their quest for high-grade silver ores. It is only in the past eighteen months that the demand for gold properties has sent the prospectors seeking the yellow metal in this quarter, and among the first claims taken up and located in this district was the old Oro Blanco. Since that time a new shaft has been sunk and the property slowly developed, and under modern machinery and management it bids fair to become a valuable property.

About fifty feet from the easterly end of the cut, and yet further east than the shaft sunk by the present owners, a shaft was put down during the early part of last year, and twenty tons of the ore milled at the Yellow Jacket mill as a test of its value and to pay expenses of the work. The superintendent of the Yellow Jacket mill informed me that the ore gave an average of $20.50 per ton in gold. The shaft is sunk on the vein, and goes down almost vertical, the ledge having hardly any "dip" or incline. The walls are porphyry, smooth and well defined, with a clay gouge from one to three inches thick on each wall. The vein is from five to six feet in width between walls; the vein matter is composed of soft decomposed porphyry and ground up, granulated quartz, thoroughly disseminated through it, most all of which is stained with oxidized iron. The soft, ground-up condition of the vein shows immense action at some time or other. The gold extracted from this ore is of a character known as fine "shot gold," being heavy and remarkably pure, notwithstanding the fact that the name "Oro Blanco" signifies "white gold."

From seven samples, taken from the ends and bottom of the shaft, returns were made of an average of $13.50 gold and 2.60 ounces silver per ton.

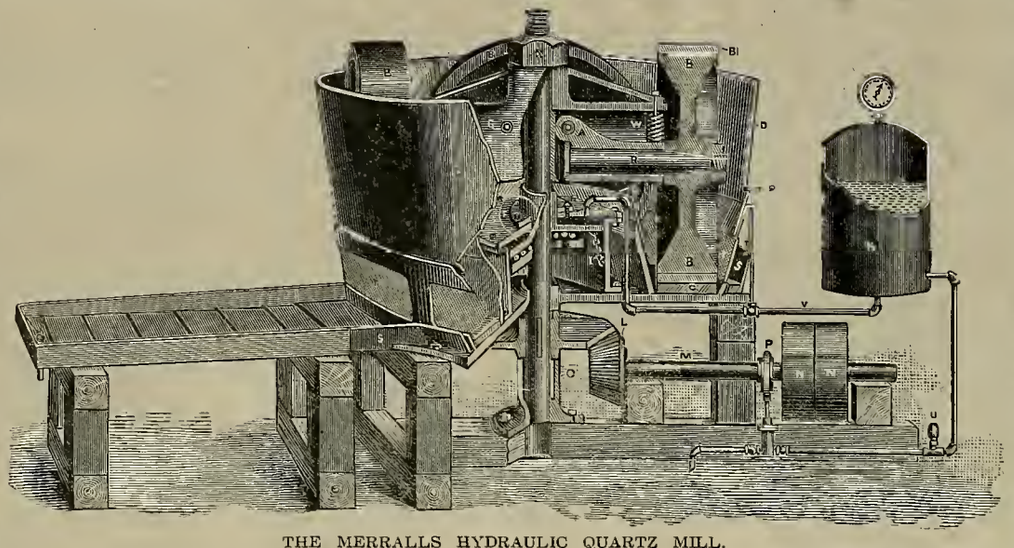
Labor can be procured at from $1.50 to $3 per day for miners and from $1 to $1.50 for common laborers.

First-class roads from Tucson, a distance of about eighty miles, and a new wagon-road over the mountains to Nogales, a distance of thirty-two miles, give cheap freights and good service. The climate and water of the Oro Blanco mountains cannot be surpassed in any mining camp in the United States.

The Merralls Mill.

The Merralls Hydraulic Quartz Mill is the latest applicant for favor in the eyes of the miner for pulverization of ore. The claim of the owner and inventor that this mill is based on common-sense ideas, and is superior to any other wet mill now in existence, is to be determined by practical test.

"As shown in the accompanying illustration, the



THE MERRALLS HYDRAULIC QUARTZ MILL.

cast-iron bottom of mill rests on heavy trestles, on which are cast the annular mortar, and in which rests the steel die, *C*.

"*S* shows the chute for carrying off the pulverized ore and water as it comes through the screens, *T*, and is conveyed to the amalgamated plates, as shown. *T* are the screens, the entire circumference of the mill, which gives this mill very large screen area. Consequently the ore is not slimed, for, as soon as pulverized, it passes out of the mill into the chute, *S*. *B*, *B* are the crushing wheels, made open, as shown, to facilitate the discharge of the crushed pulp through the screens. *B1* shows the steel tire or shoe around the wheels, *B*, *B*, made very massive and strong. At *I* is shown the cylinder, bolted to the pan, in which is the piston, *H*, with part of the piston extending up the upright shaft. At *L* is shown a collar securely fastened to the shaft, and between the collar and piston, *H*, is a ball-bearing. These are steel balls running in oil to reduce the friction that occurs when the pressure of water is applied to the piston, *H*. This piston has a leather cap (common to all hydraulic valves) fixed on it, and does not revolve, being held by the chains, but the upright shaft revolves through it. *F* is the top of the cylinder, bolted to the cylinder. *E* shows the inside cone of the annular mortar around which the crushing wheels revolve. At *P* is shown the pumps on the horizontal shaft, *M*. *K* shows the tank or receiver for the water that is pumped by the pump, *P*. In this tank is a column of air which acts as a spring to drive out the water when the three way cock, *O*, is opened. *U* is a relief valve, that can be set at any desired pressure, and regulates the amount of pressure on the piston, *H*, and in the tank, *K*. At *A* is shown the hinged box in which the wheel shaft, *R*, revolves, and on which are keyed the crushing wheels, *B*. *W* shows the massive coil springs, in nests, that receive the pressure that is imparted by the action of the water on the piston, *H*, through the spider, as shown; and when the pressure is on, the steel springs, *W*, close within three inches, so that in case a bolt, nut, drill or hammer should get into the mill, each wheel will lift up and pass over the obstruction. Each wheel acts independent of the other one, and is hinged by the hinge bolt, *G*. At *V* are shown the water pipes from tank to piston; *L*, the gears; *D*, splash apron. *N*, *N* show tight and loose pulleys. At *O* is shown the step-box that holds the upright shaft in position. *X* shows the tension nut, on the top of the upright shaft, to regulate the height of the spider.

"Ore is fed into the mill from the self-feeder, or by hand, through the ore chute; and as the crushing wheels revolve, it is thrown under them and soon reduced. The scrapers (not shown) keep the ore on the die. As soon as reduced fine enough, it passes out of the screens, consequently is not slimed, but in a good condition for concentrating. By turning the three-way cock, any desired pressure can be brought on the crushing wheels—10, 15, 20, 25 or even 50 tons pressure on each wheel—and this instantly and with no dead weight to be carried around, as the ball-bearing under the piston and between the collar on the shaft reduces the large amount of friction that might exist. It has at the same time a twisting motion, on the same principle as one standing with a walnut under his heel, his whole weight resting on it, and it does not crack; but the moment one twist is given by the foot, the entire molecular structure of the shell is broken. So with the manner of reducing ores in this mill, which is going on continually. As fast as it is fed into the mill, it is under the crushing wheels, reduced, and out over the amalgamated plates, ready for amalgamation. Having been ground by the twisting motion of the wheels, the gold is brightened and the rust or film removed, hence a large saving here takes place which will pay for a mill in a short time, by reason of this scouring of the gold."

W. A. Merralls is the inventor and owner of this mill. His address is Room 12, 3rd floor, Mills Building, San Francisco.

HOW COAL IS HANDLED HERE—READY FOR THE RETAILER.

PART OF A YARD.—*See page 305.*

We hear of finds in other parts of the State, and of course, all are "rich." The orchardist and gardener put the big peaches and strawberries on top in the box; so the miner, being human, does not hide his nuggets at the bottom of the ore-sack.

When a belt gets saturated with waste oil, an application of ground chalk will soon absorb the oil and make the belt workable.

Scientific Progress.

A Changing Map of Trade.

The *Age of Steel* says: "There is no fixedness in commercial supremacy. It has come and gone from one nation to another, and all the way down the page of history the bright and dark lines have had their changing alternations. They are changing now and the shifting lines are slowly shaping the destinies of nations, young and old. Rightly or wrongly, by fair means or foul, the older nations are pushing their conquests or colonies wherever the opportunity offers, to retain their grip on commerce, by securing new markets for their surplus products. Commercial necessity has replaced the old lust of empire, and is really the key to the avidity with which Europe is dividing Africa as hunters do their game, and is casting its eye over continents and oceans for commercial territory. In the western hemisphere the same impulse is making itself felt with more or less of the same reasons, and is at the bottom of much of the idle but significant talk of annexations, protectorates and other forms of grabbing real estate. Taking this, however, at what it is worth, and leaving the grave hazards it involves to take care of themselves, it is beyond a doubt or peradventure a sober and undeniable fact that the routes of commerce are shifting from the Atlantic to the Pacific. In that direction lies the future arena of the world's struggle for commercial supremacy. A glance at the growth of populations from the western slopes of the Rockies to the sunset rim of the sea lines, and from Alaska to the Mexican border, with what it signifies of enterprise and development, we see the massing of a commercial momentum that will dot the Pacific with its ships and overlap the fringes of Asia. The eddies of this movement will eventually spread beyond the Isthmus to the Horn, and history will run its iron pen over an opening chapter in the story of man. With Siberia intersected with Russian railways and its areas populated; with Japan a new and potent factor in the East and China waking out of its loug slumher, to say nothing of the future of Australasia, with its persistent and aggressive race, it needs no prophet to forecast the coming change in the map of commerce. The place of the United States in this recasting of history is settled by its geography. Some years ago we outlined this route of destiny, and we see it more elaborately and broadly defined in a recent issue of the *North American Review*, in which the facts noted in this article are succinctly stated. From a national point of view this outlook is more than encouraging, and, we make hold to say, our destiny in this matter can be best reached not by jingo, but by the merchant and manufacturer accepting the situation and not neglecting its opportunities. There is no need to force the tide when it runs in our favor."

Formation of Coal.

The formation of coal, according to Dr. Homer Green's cosmical theory, was due to the solar orh bringing forth, millions of years ago, when it was larger and hotter than to-day, a wonderfully luxuriant vegetation, including plants of strange kinds, mosses as large as forest trees, and ferns thirty feet in height, growiug up richly from the clayey soil and forming dense jungles in the vast marshes, the latter covering great areas of the earth's surface; these ferns, mosses, and the leaves, branches and trunks of trees in time falling and decaying where they grew, only to render the soil more fertile and the next growth more luxuriant. Year after year, century after century, this process of growth and decay going on, until the beds of vegetable matter thus deposited became of great thickness; the earth's body, however, still continued to shrink, in consequence of which her crust at times contracted and fell in, the land then sinking throughout vast areas, the beds of vegetable matter going down and the water sweeping again over the great marshes, sand and mud and gravel were laid down anew over the deposits, and the clayey soil from which the next rich growth would spring was spread out on the surface, this process being repeated again and again, as often, indeed, as seams of coal in any coal bed. In this way, according to Dr. Greene, the conditions for the formation of coal were made complete, atmospheric air being entirely excluded, while the vegetable beds underwent the processes of decomposition, so that in some beds of coal whole trees have been found, with roots, branches, leaves and seeds complete, and all converted into the same kind of coal as that by which they were surrounded.

Wood Pulp for Horseshoes.

A practical invention by a veterinary surgeon is now successfully applied at Berlin. He manufactures horseshoes of paper, impregnated with oil or turpentine, to make it waterproof. After being saturated, it is glued together in thin layers with a cement which does not become brittle when drying, and consists of a mixture of Venetian turpentine, powdered chalk, linseed oil and lacquer. These horseshoes are made in various thicknesses. The holes, admitting the nails by which the shoe is fastened to the hoof, are stamped through the paper when moist. It is then subjected to a very strong pressure under a hydraulic press, and, when dry, can be filed and planed to fit the hoof snugly. The inventor has also attempted to make these horseshoes of paper pulp, adding chalk, sand, turpentine and linseed oil in such quantities that the material is impermeable to moisture. This composition possesses the necessary elasticity and toughness for the purpose. It can be pressed in moulds and dried afterwards, or cut out of blocks of the mass and placed under strong pressure. The shoes made by pasting together paper sheets are preferable, as they are stronger than those made of the compressed material. These shoes can be fastened to the horse's hoof either by nails, as usual, or be cemented with glue consisting of gum of ammonia, one part, and gutta percha, two parts. The great advantage claimed by the inventor for the new shoe is the impossibility of the horse slipping on slippery roads.

The Secor System.

The immense amount of fuel which it is necessary for trans-Atlantic steamers to carry occupies so much space that not enough passengers and merchandise in addition can be carried to make the vessels self-supporting. This trouble is to be obviated by the Secor system, which, stated in its simplest form, consists in the use of several inclosed cylinders, into which are introduced a mixture of air and atomized fuel, which being automatically ignited, is discharged directly against the external water at the stern of the vessel. The instantaneous explosion of the gases drives the vessel forward in the water just as a rocket is elevated in the air. The explosions, under perfect control, are produced with perfect regularity and average 300 per minute. This invention, it is thought, will cause as great a commercial revolution as that which followed the original introduction of steam.

It is now believed, and with high probability of the truth of the theory, that the shooting stars which sometimes fall to the earth in a semi-molten condition are almost or wholly devoid of heat when they enter the atmosphere. They are set on fire hy friction against the air due to the rapidity of their motion. It is possible that the force of the earth's attraction solidifies such meteors from a gaseous condition in which they may exist in space.

The sun has about 228,000 times the mass of the earth, and the moon only one-eightieth of this mass.

Mechanical Progress.

Induced Draft for Steamships.

In order to get more steam for an engine from the same furnaces and boilers, the natural draft is often supplemented hy an extra one, artificially produced. This may be done in two ways: Air may he forced into the fires from below, or it may be sucked in hy creating a partial vacuum ahove. The former method is the most common on steamships; the latter is usually practiced with locomotives, in which the desired effect is produced hy the discharge of exhaust steam into the smokestack. "Induced" draft, however, after being tried on some small vessels, is about to be employed on one of the largest battleships in the British navy, the Magnificent, launched a few weeks ago, and having a displacement of 14,900 tons.

Where triple-expansion, condensing engines are used, there is no exhaust discharge; and a different means of securing the desired object must, therefore, be adopted. In the present instance, there will be rotary fans in the "uptake," after designs by W. A. Martin. This expert in mariue engineering declares that a forced draft tends to concentrate the heat of a furnace at special points. This is advantageous in an iron foundry, but not in a steam hoiler. "The initial effect of such draft," he says, "is under the body of the fuel, and the gases generated are driven on without any controlling influence, whereas with induced or exhaust draft the initial effect is on the top of the fuel, and the gascs evolved are under the control of the draft until they are passed through the funnel." More complete combustion of the gases, the prevention of deposits of ashes in the tubes, aud longer life for the boiler are among the advantages claimed for the latter plan.

Sweeping with Compressed Air.

One of the most notahle of the present century's small inventions is an air pump for cleaning purposes. A hose pipe charged with air under fifty pounds pressure to the square inch is turned upon the article or room to be cleaned. It is used in precisely the same way as the water and the hose for washing purposes. It is far more effective in its result than brooms, beaters or brushes, as it searches out and penetrates every crevice and cleft in woodwork. This device is at present applied to cleaning cars, but so perfect is its work that it is only a question of time when it will come into use for other purposes. Hotels and large buildings might be swept out and dusted in an incredihly short space of time. Carefully managed, this air pressure would rid the room of every particle of dust, clean furniture, carpets and the heavier articles of hric-a-brac and ornaments. It would do the work of a dozen people. It is now in order for some home missionary to invent some simple device that will work an air pump and current for household usc. Its introduction would revolutionize housekeeping and solve the heretofore hopeless problem of clean rooms, and will keep furniture, covers and carpets. It would he economical, as it would render less service necessary, and would save a large portion of the wear and tear of furnishing textiles. In houses where there is hydrant water it would not be at all difficult to attach an air-pumping apparatus to the kitchen or bathroom faucet and thus furnish power for every floor. Some years ago it was said that there would never he an invention that could sweep the dust, but at the present rate of things the prohlem is practically solved by this simple and easily used device.

There may be some truth in the argument made against the use of low-water alarms; that they encourage carelessness or neglect, and that their use enables owners to economize by employing incompetent help at lower wages. These arguments are not good against the fact that every mechanical as well as personal precaution should be taken to guard against accidents or injury of every kind. It is Chinese logic to say a good thing is not a good thing because its use is sometimes abused. Every argument presented against the low-water alarm can with equal or greater force be directed against the safety plug. With a low-water alarm in good working order there is precious little use for a safety plug, as the alarm will arouse even the most careless engineer to action hefore the water gets low enough to melt the safety piug or even injure the boiler.

A Headlight for Curves.

An ingenious machinist in the Dunsmuir railroad shops, says the Redding *Free Press*, has constructed a swinging headlight on engine 1769 that works automatically. In going around sharp curves, headlights on locomotives being made stationary throw the light straight ahead instead of throwing it so that it follows the track, where the light should be at all times; and it was this that started the gentleman to thinking how to remedy the defect. The contrivance which he has invented for making the light follow the track is very simple, and it is a wonder it was not thought of sooner. In the first place he has made the headlight to hang by two pivots, one on top, the framework that holds it being fastened to the smokestack and the hottom one to the boiler-head, and from the bottom of the headlight two chaius run to the ends of an extending arm and this arm is connected by a rod which ruus to the pilot wheels truck. As the pilot wheels strike a curve the outside wheel of course forges slightly ahead and this movement works the rod and chain just enough to move the headlight so the reflection is cast directly ahead on the track. It is said that it works very well and in the winter season will be a great benefit to engineers, for on mountain roads where generally there is but little straight track, boulders often fall, and if there be no light ahead a train will strike one hefore it can possibly be stopped.

It has been settled in the minds of several mechanics who have given the subject of belting their close attention, that a belt two inches wide and of single thickness, running on a pulley eight inches in diameter, represents about as near a perfect belt transmission as it is possihle to get with oak-tanned leather helting. This may seem rather a favorable conditiou for a belt of this dimension to be working under, hut as far as the pliability of the belt is concerned no one would object to the curvature of eight inches, and as for the width, one inch and a half might be considered quite narrow, and three inches in width somewhat wide. However, if this oak-tanned material will endure all this bending action while under a high speed, and drawu up taut enough to give a good account of itself when power is to he transmitted, then it must be expected that a pulley sixteen inches in diameter, when provided with a double thick belt of four inches wide, is giving equally as good satisfaction. Not only this, but the three-ply leather helt should, on the same basis, be employed whenever two shaft wheels are to he connected that are twenty-four inches in diameter, and for a perfect width six inches must he considered about the proper dimension. At this rate many of the large belts that are in use are much too wide, and altogether too thin, which, no doubt, could be improved by giving some attention to this comparison.

M. Moissan has recently succeeded in preparing pure titanium by means of the electric furnace. The metal proves to be the most refractory of any he has yet dealt with, being less fusible than pure chromium, tungsten, molybdenum, uranium or zinconium. It is an extremely hard metal, capable of scratching the diamond. It is, however, soluble in lead, copper and iron.

Electrical Progress.

What Electrical Engineers May Expect.

F. H. Ford puts forward in an electrical journal a strong disclaimer of tbe statement which has been made in a daily paper, that "for the average young man the field of electrical engineering offers more promise of success than law, authorship, the grocery business or knife-grinding." Mr. Ford says that serious harm is being done in the continual holding up of the profession of the electrical engineer as one offering almost unlimited possibilities in the matter of salaries and demand for men. The closing of many large works owing to financial trouble or patent litigation bas thrown a large number of men of both experience and ability on the market, and the supply of engineers is in excess of the demand. The struggle for place which bas naturally followed bas forced down wages so low that the average engineer cannot command a better salary than tbe head bookkeeper of a large wbolesale concern. The young man who cbooses electrical engineering as a professiou must be prepared to work hard and long, and for wages wbich would ordinarily be considered inadequate for the work done. If he loves engineering for its own sake, there is as good a field in the electrical as in any brauch of it, but the idea tbat there are positions witb large salaries attached waiting to be filled by him is a mistake. There are but few high salaried positions at best, and they are occupied by men who have large experience and solid influence witb the capitalists at tbe back of the company. The young electrical engineer will be obliged to spend at least six years in preparation before he can earn enougb to barely pay bis expenses, and nearly all this time he will be paying out money instead of earning it. The same time speut in preparation for either law or medicine would qualify him for beginning practice, wbile if it were devoted to business or journalism, it should give tangible and satisfactory results. The young engineer usually has to start business for himself with very limited capital, if any, and has to accept a subordinate position witb some compauy. Here his best ideas as well as his best work are given almost entirely for the benefit of his employer, and he bas to suffer for bis failures as much as if be were working for bimself. Mr. Ford maintaius that the demand in electricity at tbe present time is not for educated electricians, but for educated capitalists wbo can understand that in the long run it will pay them far better to secure the services of capable officers who know why things should be doue, and who will look after economy in the output, than to hire cheap and irresponsible men wbo waste more than the salary of a good man in iuefficient methods of working. Mr. Ford thinks it is only wben capital has beeu so educated tbat the relation between work done and pay received by the electrical engineer will compare favorably witb that of the lawyer, the doctor, the writer and the merchant.

Signaling Through Space.

Iu further confirmation of the successful experiments concluded last year in England in transmitting telegraphic messages over long distances without wires, an accouut has been received from Scotland of the maintenance of telegraphic communication by means of the same system between the island of Mull and the mainland. The islanders were decidedly put to a shift. The six-mile cable which usually kept them iu touch with the other world had broken down, and they were uucertain as to how loug the interruption to communication would last. A local electrician, who had heard of Mr. Preece's plan, saw no reasou why it should not operate at Obau, just as well as anywhere elsc, and lost no time in running a gutta-percha insulated wire, one and one-half miles long, along the ground from Morvern, fifteeu miles from Oban, and signaling through that, while on the island of Mull the ordinary overhead circuit connecting two distant villages was made use of. The distance intervening between the two parallel circuits was about three and one-half miles. A vibrator was used as a transmitter, and a telephone as a receiver, and the usual telegraphic traffic was carried on until the cable was repaired. An account not so well authenticated comes from India of the completion by Professor J. C. Bose, of the Calcutta Presidency College, of some instruments by which extraordinary results are said to have been obtained. Certain phenomena have been reproduced without any connection between the transmitting and receiving stations. Siguals in the form of light and sound have been passed along the ether, without any other apparent means of transmission, and even solid walls have not interposed any obstacle to the passage of these signals.

Buda-Pesth's Underground Road.

A new double-track electric road in Buda-Pesth, the capital of Hungary, is being constructed under peculiar difficulties. In the first place, as the avenue through which it runs is handsome and fashionable, it was deemed best to put tbe road uuderground. But tbe existing sewers, to say nothing of gas pipes and water-mains, are located in the center of the street, at too great a depth to make it advisable to go under them, but bigh enough to leave only about nine feet of space between tbem and the surface of the street. Economical and otber considerations finally led the projectors to adopt a route above the sewers. In order to gain all the room possible in a vertical direction, tberefore, the upper surface of the sewers—whicb are circular—is shaved off here and there and replaced with a flatter iron cover, suitably stiffened, and the street level has also been raised a trifle. So thin is tbe arched tunnel roof tbat at its center a row of posts is needed to sustain it. It is thus practicable to get nine feet from the top of the rails to the under side of the overhead iron beams running lengthwise and buttressing the arch. A total widtb of 19 feet 8¼ incbes is secured. Sides, top and bottom are made of coucrete, but tbere are also irou cross-beams in tbe roof. What is called "asphalt felt" is introduced into the top and bottom to exclude water.

The current to operate the road is supplied by overhead wires, of which there are two for each track. The return is effected by a continuous copper conductor, and not by the rail. The tops of the cars come within four inches of the roof of tbe tunnel. Of course, the cars are bung very low. It is intended to operate them in trains instead of singly, but not to have one car communicate witb anotber. There is a block system wbich prevents a following train coming within a mile and a quarter of the one ahead of it. The current is switched off automatically if cars euter a block before they are entitled to. Again, at the end of the line the current is shut off automatically from the train. The line is to be ouly two miles long when completed, and it is now nearly half built.

THE subject of phosphorescent lighting—one that will afford illumination direct without the wasteful accompaniment of heat, and which will approach in efficiency that of the glow-worm—has recently received an added interest by the success of the experiments made iu this direction by D. McFarlau Moore. The line which Mr. Moore has marked out for himself contemplates the introductiou of phosphorescing glow lamps ou continuous or alternating current circuits of ordinary potential, with the addition of but the simplest auxiliary apparatus.

THESE five years have indeed done wonders in the domain of street railroading in this country, and have even set our transatlantic friends to work following our example, says Joseph Weltzer in *Scribner's* for May. To give some idea of tbe extent to which electricity bas displaced the horse, and, on the other haud, been instrumental in creating new roads, we need only cite the fact that at the present time there are over 850 electric railways in the United States, operating over 9000 miles of track and 23,000 cars, and representing a capital investment of over $400,000,000. Wbat stupendous figures wben we consider that in 1887 tbe number of such roads amounted to only thirteen, with scarcely 100 cars.

AMONG the securities enumerated in the assets in tbe report of the General Electric Co. for the year ending Jan. 31, '95, appear the following stocks: Los Angeles Edison Electric Co., $40,000; Portland, Or., General Electric Co., $527,800; Tacoma, Wash., Railway and Motor Co., $45,000; bonds: Los Angeles Cons. Electric R'y, $41,440; Portland G. E. Co., $67,000; Seattle Power and Railway Co., $21,000; Sacramento E. P. and L. Co., $10,000; San Francisco and San Mateo R'y Co., $15,000; Tacoma R'y aud Motor Co., $200,000; par value.

THE next convention of the National Electric Light Association will be held in New York City next May.

OUR esteemed contem., the *Electric Review*, is viewed as a humorous journal in the Soutb.

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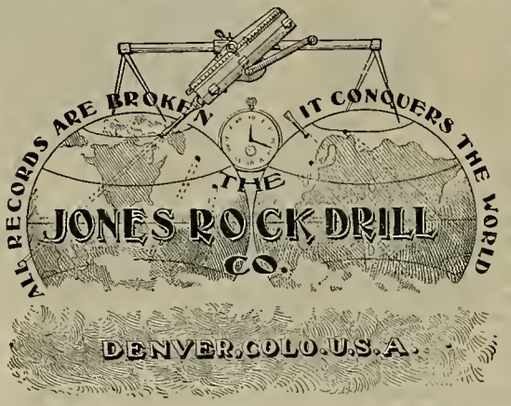

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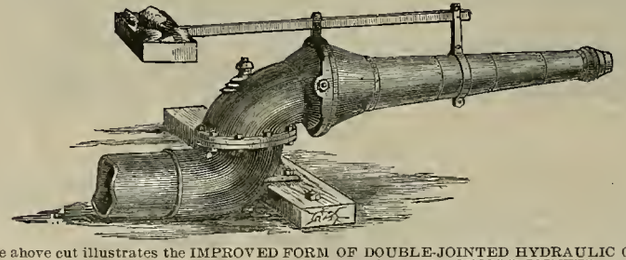

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Ball Bearings.

Commenting on the growing introduction of ball bearings, which, as may be remembered, first found practical use in diminishing the friction of bicycles, Dr. Coleman Sellers, in a recently delivered lecture, pointed out that one of the most notable examples of the use of the balls is to diminish the friction of the collar that sustains the hook of a large crane. Without the balls the difference between the friction of rest and the friction of motion is so great that men are often seriously hurt by endeavoring to turn a load suspended upon the crane hook, which requires a great deal of exertion to start it, and when it does move, goes farther than is intended, often leading to serious accidents. By making the crane hooks with flat washers, between which numerous small balls are placed, resting on hardened surfaces, there seems to be no difference between the friction of rest and the friction of motion, and hooks heavily loaded are turned with remarkable ease, so that the use of balls, distributed over plain surfaces, is quite common, there being no basket or grooves to separate the balls, which latter are allowed to move at their own will in whatever direction they are inclined to go. There is very little literature on the subject, and the theory of ball bearings has not been worked out and published. It may be interesting, however, to know that some experiments have been going on for some time past in reference to the size of the balls best suited to the different purposes. In the case of hooks for cranes carrying about fifty tons, between 250 and 300 balls, each of three-eighths inch diameter, are scattered between the flat plates, with the idea that the more points of contact the longer the belts will last; but some experiments are now being tried with balls of different sizes, and motion kept up under loads to determine their durability, with a leaning in favor of larger balls and fewer of them.

Too Much Tongue.

Where employment is given to more than one person, the bane of success is the talking man. One who has always something to say takes his own time and the time of others to hear his "too much tongue." Those employed may not stop work altogether to hear what is said, but they will lessen their efforts, and their minds will be diverted from their labor and less will be done. But the talking man usually succeeds in getting others to stop work for a short time to hear him, and if he is allowed to talk without hinderance he will consume a great deal of time.

Some of these "too much tongue" have a gift of almost continuous "gab." They will give the impression to others that they are keeping step with others and talk at the same time, but there is a lack of dispatch in their efforts, and there will be this same lack with the men who listen to them.

One of two things should be done by the employer. Stop the "too much tongue" by a kndly request, and if the request is not heeded, then discharge the fellow who wags it to the injury of the business. The party may be clever, good hearted and well meaning, but these good qualities will not compensate the employer for the waste of time.

Decision Against the Cowles Electric Company.

An opinion has been handed down by United States Circuit Judge Taft, of Cleveland, O., deciding a famous patent case which has been in court for a number of years. The suit was brought by Francis Lowery, executor of the estate of Grosvenor P. Lowery against the Cowles Electric Smelting and Aluminum Company and Alanson T. Osborn. The defendants claimed they had the right of two patents by assignment from Charles S. Bradley, for a process of separating metals, particularly aluminum, from their ores, by the use of an electric current, both to fuse and decompose the ores. They claimed they came into possession of the patents by virtue of a sale to Alanson T. Osborn, who was said to have assigned the right to the Cowles Electric Smelting and Aluminum Company. The plaintiffs, on the other hand, claimed that Bradley sold and assigned the patent right to them, and that they held letters patent at the department of patents in Washington. The Cowles people also held letters patent, and the suit was to determine which party was guilty of infringement.

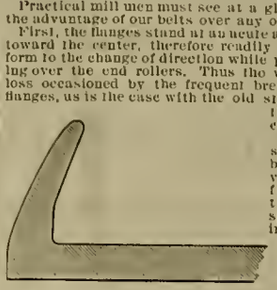
Judge Taft, in a voluminous opinion covering over fifty pages of type-written matter, held that the defendants had infringed and were not entitled to letters of patent. He granted the plaintiffs a perpetual injunction restraining the defendants from using the patent rights, and ordered the letters of pateut held by the Cowles company canceled and declared void.

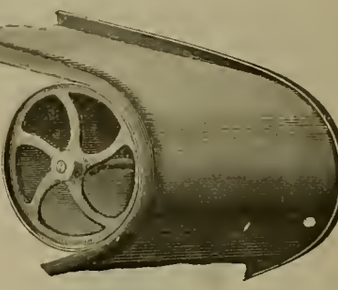
THERE is considerable excitement among Canadian miners over the discovery of phenomenal deposits of chromic or chrome iron in Coleraine. In one case it is only necessary to blast it from the side of a mountain, and four or five blasts suffice to furnish 100 tons. All thus far shipped out of Canada has been taken by the Carnegie Steel Company of Pittsburg. The ore averages for the most part over 50 per cent. of metal, costs little or nothing to mine, is found close to a line of railway, and is worth $25 to $35 per ton.

THE thumb, according to professional palmists, is an unerring index of the mind. If a person is trying to deceive you, he will invariably draw his thumb in towards the palm. On the other hand, if he is telling the truth, the thumb will be relaxed and point away from the palm.

Blasdel Improved Concentrating Belt.

We keep in stock belts suitable for the Frue, Triumph, Johnston and Tullock machines, and make all lengths and widths to order.





Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome. Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty rifles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect; Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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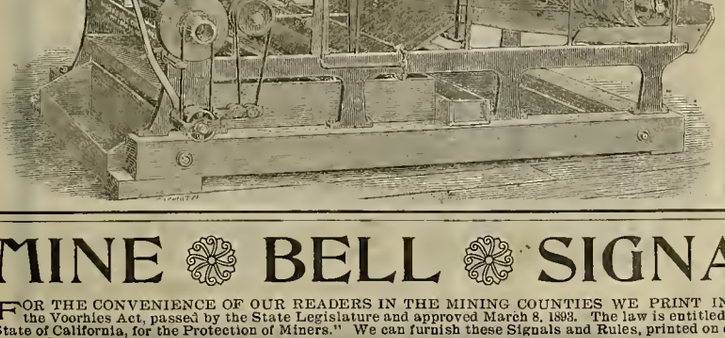

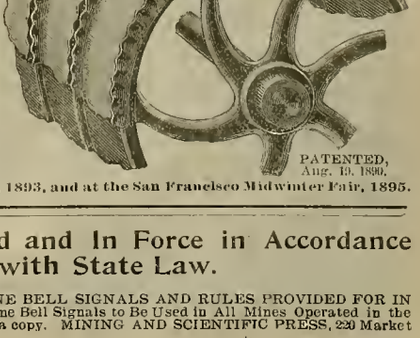

PATENTED, Aug. 19, 1890.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1895.

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Legal Decisions on Mining Questions.

Condensed by *The Colliery Engineer and Metal Miner.*

Placer Mining Rights.—One having a placer mining right, which can only be acquired on public land, can maintain suit to quiet title, if at all, only as to his limited interest.

Carter v. Thompson (U. S. Cir. Ct. Dist. Montana) 65 Federal Reporter, 329.

Placer Patent—Exclusion of Quartz Lode.—A lode or vein, to come with the Revised Statutes of the U. S., Sec. 2333, exempting it from the grant of a placer patent if its existence was known at the time of the application for such patent must be of such extent as to render the land more valuable, and of such value as to justify exploitation and development.

Brownfield v. Bier (Supreme Ct. Montana) 39 Pac. Rep. 461.

Deceit in Sale of Mining Stock.—The measure of damages on a sale of mining stock, voidable on account of fraudulent representations, is the difference between the real value of the stock at the time of sale and what the value would have been had the representations been true.

In an action to recover damages under such circumstances, the market value of the stock at or about the time of the sale is evidence on the question of its real value.

Representations by a vendor of mining stock that the purchaser could not lose on the investment, and that the mines would pay dividends in the near future, being a mere expression of opinion, or a promise of a future condition of things, will not form a ground of recovery by the purchaser on the ground of false representations.

Warner v. Benjamin (Supreme Ct. Wis.) 62 N. W. Rep. 179.

Action Against Mine Owner for Death by Wrongful Act.—The Court of Appeals of Colorado receutly decided the following points, in an action brought by a party for damages caused by the death of his son while working in a mine:

(1.) A parent may recover for the death of a child, although the latter never contributed to the parent's support.

(2.) In an action by a father to recover damages for the death of his son, evidence of an arrangement between the two, for a loan by the son to the father, is admissible on the question of damages.

(3.) A miner working in a shaft upon a high column of dirt, supported above the bottom of the shaft by a sufficient bulkhead, does not assume the risk of the additional danger caused by the removal of the bulkhead without his knowledge.

(4.) Where a miner worked in a shaft upon a high column of dirt, supported by a strong bulkhead, which was removed without his knowledge, he is not guilty of contributory negligence.

(5.) When the evidence as to the place where such party worked is sufficient to show whether it was safe, it is not error for the court to charge the jury that the mine-owner was bound to provide a reasonably safe place for him to work in, without defining what a "safe" place was.

Molly Gibson Con. Min. & Mill'g Co. v. Sbarp, 38 Pac. Rep. 850.

Appropriation of Streams on Public Land for Mining Purposes.—The Supreme Court of Washington holds that the Act of Congress, July 26, 1866, did not create the right to use by prior appropriation of streams on public land for mining and irrigating purposes, but simply recognized such right which had grown up through the acquiescence of the government and the universal custom of the locality.

Isaacs v. Barber, 38 Pacific Reporter, 871.

Interpretation of Contract of Sale.—Where a contract for the sale of coal during a period of five years provides that "settlements for said coal shall be made upon the 15th day of each month for all coal delivered before the 1st day of such month," and the buyers pay according to the terms of such contract, but under protest, because of the alleged inferior quality of the coal, the payments are voluntary, and cannot be recovered.

The court said: We can only understand this to mean that the amounts owing for coal were to be fixed, determined, adjusted, settled, at the middle of the month. We cannot hold that the parties having used such language meant really its opposite; that is, that although these monthly settlements were actually made, and the amounts paid, those preceding deliveries still remained open, subject to any kind of controversy which either party might choose to set up subsequently, throwing the whole subject of deliveries, which would necessarily include the amount and quality of the coal delivered, the prices to be paid, and all matters affecting those questions.

Armstrong v. Latimer (Supreme Ct. Penna.) 30 At. Rep. 990.

Failure to Enjoin Blasting is Not Contributory Negligence.—Where a contractor employed by a party to do blasting near another's house proceeded with the work in so careless a manner that such house was injured, the failure of the owner of the house to enjoiu the continuance of the work was not contributory negligence.

Berg v. Parsons (Supreme Ct. 1st. Dept.) 31 N. Y. S. Rep. 1091.

Action to Forfeit Mining Lease.—A mining lease which provides that it shall be void if "the enterprise shall be abandoned 12 months" is avoided by failure of lessee to commence mining operations within 12 months after the lease commences.

The fact that the lessee is unable to work the lands for lack of railroad facilities, and, that having leased other lands in the vicinity, he is approaching the lands in question as fast as he can, is immaterial.

An action by a lessor alleging his title to the land, and the execution of the lease to the party sued, which under its provisions has become void, and praying that the lease be declared void, will be treated as an action to quiet title.

In this case it was contended by the lessee that "the enterprise could not be abandoned unless it had been begun, and that it continued to subsist for the entire term, though not a single thing was done under it. The court said: We think it was clearly contemplated by the parties that a mining and quarrying enterprise was entered upon by the execution and acceptance of the lease, and if nothing more was done within 12 months after its execution, it would be an abandonment of the enterprise for 12 mouths; and therefore the lessor had the right to have the incumbrance on the title removed.

Woodward v. Mitchell (Supreme Ct. Ind.) 39 N. E. 437.

Gold in Iron Ore.

Samples of the Dexter mine ore in the Lake Superior region, taken from the stock pile were assayed recently by E. F. Bradt, chemist for the Lake Angeline mine, and were found to contain gold. The result of the assay was not a surprise to the management of the mine, as those interested in the property have known for some time past that the ore contained more or less gold. The samples were not taken from any particular part of the stock pile with a view to getting the best possible results, but were picked from different parts of the pile. According to the assay the ore contains gold at the rate of about $3.75 per ton.

The management feels greatly encouraged over the result, and intends to devise some means of treating the ore for the gold it contains. There are about 3,000 tons of ore in stock, and more is being added to the pile daily. The ore is a rich manganese and is always in demand. The mine is only a short distance from the Michigan and other gold properties in that vicinity.

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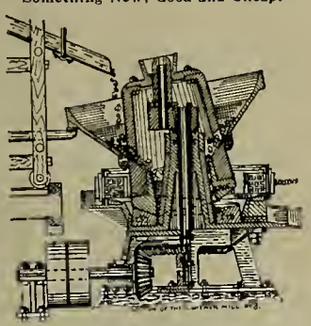

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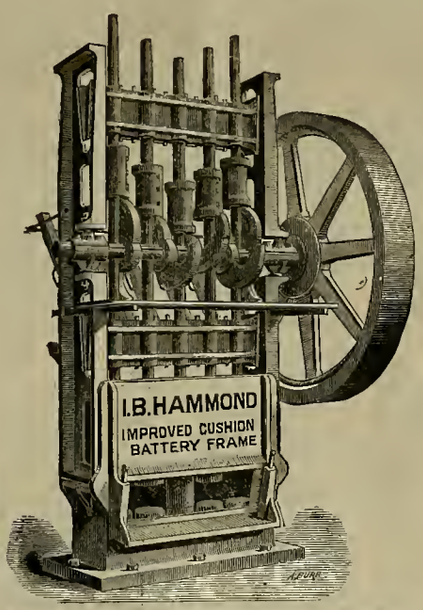

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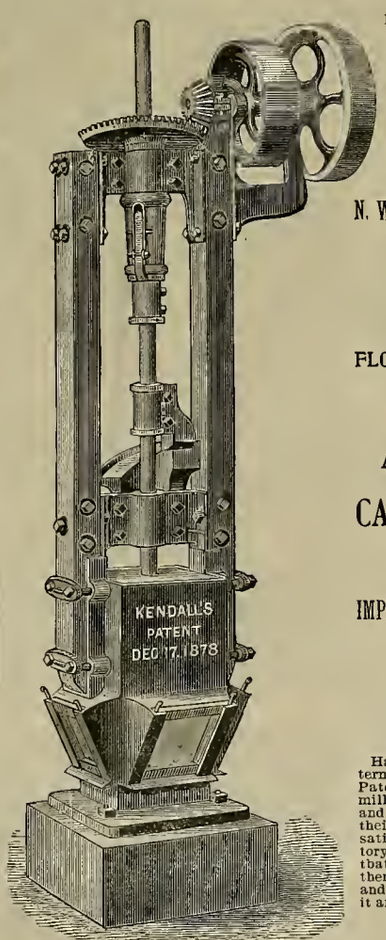

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TABLE OF CONTENTS.

The following brief abstract of the contents will give an idea of the branches of the subject treated:

General Plan; Discussion of the Principles of Hydraulics; Rules Deduced from Formulæ Obtained; Examples and Calculations; Extensive Tables for Ready Reference; Fundamental Laws of Hydraulics Demonstrated and Expressed in Formulæ and Rules; Flow of Water Through Openings; Weir Coefficients; Triangular Weirs; Flow of Water over Quadrant Weir (tabulated); Application of Tables; Submerged Orifices; Flow Through Orifices in Thin Partitions; Tables and Applications; Miners' Inches; Tables and Calculations; Flow of Water Through Short Tubes and Compound Tubes; Flow of Water Through Pipes; Tables of Velocities and Cubic Feet Flows for Given Fall per Mile and Diameter of Pipe; Coefficient for Bend—Circular and Angular; Flow Through Nozzles; Inverted Siphons; Flow of Water in Open Channels, Extensive Tables; Rough and Ready Notes; Hints for Speedy and Approximate Estimates, etc.

Price, $3.00, postpaid. Sold by THE MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

A 1200-FOOT DRIFT.—A drift 1200 feet long is to be run on the 1000-foot level of the South Eureka mine, at $3.48 per foot.

GWIN MINE.—*Republican:* The Gwin mine shaft is down 700 feet. It is the intention to go 25 feet deeper, and then cut a station and start a crosscut to cut the ledge to ascertain its character. There are twenty-one men all told on the payroll. The drifting will be by contract. At this depth a tank is to be put in capable of holding 200,000 gallons of water. This will catch most of the surface water, and greatly facilitate the drainage of the works.

Butte.

FORBESTAWN DISTRICT.

THE STOW TUNNEL.—*Mercury:* The Stow mine and mill are upon a slope of the mountain two miles from the South Fork of the Feather river, the principal workings are through a shaft 360 feet deep with numerous levels and stopes. The descent from the mouth of this shaft to the river is very rapid, probably a thousand feet to the mile. Mr. Stow conceived the idea that by going down the mountain side and running in a tunnel the ledge would be tapped at a great depth, the mine thoroughly drained and the ore could all be run out through the tunnel, thus avoiding the the cost of the hoisting and pumping, and it is the ultimate intention to move the mill to the mouth of this tunnel. Calculations show that from the mouth to where it is expected the ledge will be encountered, is a distance of about 1200 feet. The face of the tunnel will then he 500 feet below the present lowest depth, vertically, or about 1100 feet on the pitch of ledge. It will be readily seen what an enormous amount of ore can be stoped down at comparatively slight expense.

The tunnel is all the way through solid greenstone, and is about eight feet square. Last month 102 feet were run. It is now in 600 feet or about half way.

Calaveras.

GREEN MOUNTAIN MINE.—The new eight-stamp mill at the Green Mountain mine in Chili gulch is finished. The upper tunnel is in 500 feet, the lower one 300 feet. The upper tunnel will he used as a flume.

GENERAL NOTES.—*Echo:* The Lockwood mine has been shut down duriug the last two mouths, but the present bond owners, Messrs. Rosenthal and others, of San Francisco, have orgauized and intend opening up again in a few days.

Joel Rowe, owuer of the Henry, Billy Williams and Skull Flat mines, has bonded them for $50,000.

LONE STAR.—Mr. Hurley, one of the principal owners of the Lone Star miue, was in Angels Camp last week arranging for the opening up of this mine, which will be worked on an extensive scale and bring joy to the hearts of the people of West Point.

BLAZING STAR.—Mr. Forester, the owner of this miue, is in San Francisco arranging for further improvements. It is his intention to build chlorination works which will be of great service to him and others in that vicinity in working the coneentrates, as the ore is mostly high grade. This property, with the Matrimony, Water Lily, Wide West, Smith and Bartola, have been bonded for $300,000, says the *Echo*.

BOSTON MINE.—The *Echo* hears that the owner of the Boston mine has refused $350,000 for it. Col. Robiuson, the superintendent, expects to find it another Utica.

El Dorado.

IN THE GARDEN VALLEY DISTRICT.—Work is being done on Collins' mine; prospects good. Rosecrans mine is still tied up in litigation, as is also the Lone Jack. The Emma mine is heing worked as usual. The Gardeu Valley miue will he operated as soon as the dry season comes. It is believed the Esperanza mine will have a mill erected this summer. The mine is well opened; shaft 200 feet in depth; 500 feet of levels and erosscuts.

Kern.

THE TALC MINE.—The Talc mine is located twenty-six miles from Delano and thirty-five from Bakersfield, in the White River country, in granite formation, the claim being 1500x600 feet.

The gouge is four feet in width, the pay streak six inches to two feet. The vein crops tbe whole length of the claim, and there is pay ore at all points.

The workings consist of a double compartment shaft, four feet by eight at the mouth of tunnel No. 1, a depth of sixty feet. In the face of the drift at the fifty-foot level pay ore is exposed. Tunnel No. 1 is in 600 feet—all the way on the vein and in pay ore—the longest continuous ore chute in the district.

Forty feet from the mouth of the tunnel No. 1 a winze has been sunk to a depth of 80 feet, exposing a ledge of varying width all the way down, the vein in the bottom being stronger and better than at the top. Tbis tunnel taps the vein 150 feet below the apex of the hill back of the mine.

The mouth of tunnel No. 2 is fifty feet farther up the hill and is driven in 400 feet, and is connected by air shaft with tunnel No. 1, securing perfect ventilation of all the workings.

A 3½-foot Huntington mill, of eight tons capacity every twenty-four hours, is kept running day and night nearly all the time.

THE BALN MOUNTAIN MINE.—The following is from the *Californian*: A. P. Ellis of Glenville has been working at Bald Mountain mine, White River district. Walter Williams and William James leased 190 feet of the mine and entered an old shaft and drifted to the ledge. They found a vein of rich iron ore bearing gold estimated to carry $500 to $2,000 per ton. They have taken four tons of ore by working ten feet in length and eight feet in height. They know that the vein goes at least four feet deeper, and it is about eight inches wide in the bottom. You can see the gold everywhere by candle-light in this vein. They have fifty feet above them to stope out. It beats everything ever seen in the mine, or ever heard from Indian stories. Mr. Ellis offered to take one hundred and fifty pounds of the rock for a month's work and was refused. They think they can easily get a carload of this ore within the next ten days. The mine is owned by an English company and superintended by Nelson Halleck. In the main lead they have a vein two and a half feet thick that yields forty dollars per ton. The same company has a force of eight men taking out good ore from the Eclipse mine.

Los Angeles.

NEW YORK CAPITALISTS AFRAID.—Los Angeles *Times:* The *Times* is in receipt of a letter received by a gentleman in Los Angeles from a correspondent in New York in reference to mining properties in Califoruia and Arizona. The writer states that at the present time New York is, without exception, the poorest city in the United States to float any enterprise—mining or commercial. Capitalists, he says, have lost all enterprise, all that they think of being to loan money on call on securities dealt in on the Stock Exchange. He adds that this state of affairs bas been produced hy the demonetization of silver, which makes gold perform a double function, with the result of increasing the purchasiug power of gold as the consequence, the lowering of prices of manufactured goods, as well as agricultural products. The writer, in conclusion, says that such a condition of affairs has unsettled trade and produced a want of confidence which, in turn, has caused capitalists to shut down on new enterprises, and that for all this there is but one remedy, the remonetization of silver relieving gold of its present double duty.

Nevada.

WASHINGTON DISTRICT.—*Transcript:* At the Washington mine nothiug is doing except keeping the mine free from water. The same thing has been going on for four years with no signs of a change.

At the German mine, nothing can be done in regard to starting up the mine till after the third of July. Then if the old company fails to redeem the mortgage bond amounting to eleven thousand and some odd dollars, new parties may step in and start up the mine again. At the Blue Jay mine, owned by Baugh and Bonney, four men are steadily employed. Their ledge is large, rich and well defined, and their little five-stamp mill is kept running on good rock both night and day. This mine has proven the richest in this district so far as it has been developed. The Last Chance mine, at the head of Diamond Creek, has recently been sold for a good round sum to Sacramento parties. It was a part of the Yuba mine property at Maybert. There was some talk not a very long time ago about the Yuba mine at Maybert being sold but there was no truth in the report.

THE ORO FINO.—The "Curry ledge," now known as the Oro Fino, owned by Messrs. Caldwell and Curry, is to be systematically worked this summer. A ten-stamp mill is being put up.

THE MORNING STAR.—The shaft at the Morning Star mine, Gold Flat, is being enlarged, with two compartments. The machinery will run by water power. A pipe line 4000 feet from the South Yuba Water Company's reservoir on the hill will give sufficient pressure.

Plumas.

QUINCY MINING AND WATER CO.—Warm weather has furnished water, used to good purpose against a large bank of gravel which presents every indication of yielding excellent returns. The impounding works are a complete success in their retention of the debris discharged from the sluices.

Below the water storage reservoir, and along the ridge sloping down from Spanish Peak, is a vast area of mining ground containing ancient river channels and deposits of gold-bearing gravel broken from them. This slope extends down to a point north of Quincy. Already many hundred thousands have been extracted in a small way, from the territory named, just sufficient to show what can be done by a proper expenditure of capital for development purposes.

GREEN MOUNTAIN.—There is considerable work going on at Green Mountain now preparatory to a systematic examination of this extensive property by Mr. MacLeod, a mining engineer interested in a rich syndicate of mining men. This is a quartz property which, with a reasonable amount of capital intelligently applied in development work, is almost sure to grow into a mammoth and valuable mining enterprise, both to the owners and the county. The tunnels already run are in command of an almost unlimited territory threaded with quartz veins, many of which, on tbe surface, were rich.

THE TABER MINE.—Napa capitalists have put up $10,000 to develop this mine near Gibsonville. By means of a tunnel already in nearly 3,000 feet, it is proposed to tap the channel in Gibsonville Ridge, part of which is now heing successfully worked by the Thistle Shaft Company, with great success. If Mr. Taber develops the channel, he and his associates will have one of the largest and best drift mines in that section.

Riverside.

GENERAL NOTES.—Work begun this week at the Briggs mine. When a depth of 350 feet is attained it is supposed that at that depth water sufficient to run the mill will be obtained.

The Alice is still in litigation.

The Santa Rosa is pushing matters with a full force of men. In the level at the bottom of the shaft the richest ore ever found in the mine is being taken out.

San Diego.

PICACHO BASIN.—Colorado men have figures from a San Francisco firm for a 100-stamp mill, and will probably arrange to have it built. The district is looking up, and attracts considerable deserved attention.

San Bernardino.

THE MCHANEY MINES.—It is difficult to get a conservative or authentic report from these new discoveries. All the statements hitherto received appear somewhat inflated. The following is a dispatch from San Bernardino:

"McHaney arrived in this city to-night direct from the mine, and brought in 100 ounces in gold slugs, and left 50 at the mine which had not yet been retorted. This 150 ounces of gold is the product of a three days' run with a two-stamp mill, in which twelve tons of ore were worked, making the run almost $200 to the ton.

"Notwithstanding the richness of the ore there is hardly a limit to the amount in sight. The ledge is located for 700 feet, and shafts have been put down thirty feet. The vein at that depth is more than four feet wide, and the ore richer than on the surface. McHaney now has twenty men at work sacking ore, which will be transported five miles to the site of the new five-stamp mill, which will be in operation in three weeks.

"McHaney talks of $1,000,000, and says he will not consider any proposition naming a lower figure. If the ore which is already in sight should average as well as that which has been milled it would not take long to run out the amount which McHaney offers to take."

A REPORTED STRIKE.—Los Angeles *Times:* Two prospectors who came into Los Angeles bring word of a good strike in the region about forty-five miles northeast of Indio, in the Gold Blossom claim, where they say Ralph Marshall and Pete Leiuhart have found a one foot ledge which assays from $400 to $600 in gold. The same authority says that Lane & Kingman in that vicinity have struck a four-foot ledge of solid galena which yields 80 ounces in silver and $20 in gold.

Shasta.

WOULDN'T BOND.—*Democrat:* One of our mine owners, who has exposed a good ledge by shaft and tunnel, was importuned a few days ago to "bond" his mine for a year, the sample ore showing up satisfactorily. The reply was: "You can select ore from the dump, or take ore from the ledge and make a working test, but if you want the mine further you will have to pay me the stated price, cash on the nail. No bonded mine for me."

EUREKA TELLURIUM.—*Democrat:* The Eureka Tellurium Mining Co.'s mill at Salt Creek, near Middle Creek station, started up Monday and will now be run continuously. Jerry Sullivan is foreman and a force of eight or ten men are at work. More will be put to work as soon as things are running smoothly. Ten stamps are dropping and the new roasting cyanide furnaces will soon be in full blast. The company have great hopes for the Tellurium mine.

THE GOLD LEAF.—The tunnel in the Gold Leaf mine, owned by W. P. Miller, is now in 350 feet and a shaft 100 feet deep will immediately be sunk on the ledge. This property is the old Hartman claim, located near the "old Frenchwoman's," on the old Shasta road. Miller's mill, on Salt creek, this side of Middle creek, has been running steadily up to Saturday last, when it was shut down for repairs. New machinery will he put in and an electric dynamo will also be put in to furnish power and lights. Frank Whipple is head operator at the mine, which is located two miles from the mill.

TO BE SOLD.—The Crown Point and Midnight mines, located in the Centerville district, are about to he sold to a Sacramento company, represented by Mr. F. L. Fowler, who is now here and has been inspecting the property. The new company intend to develop the property extensively.

"ELECTRIC SLIMERS."—Messrs. Wright & Sump are putting in new electric slimers at the Quartz Hill Mining Co.'s mill at Calumet spur—the old Calumet mill. The slimers are for saving the free gold that escapes from the mill. The plates are charged with electricity, which holds the gold to the plates and is said to work successfully.

TEN NEW STAMPS.—The Original Quartz Hill Mining Company, operating at the Calumet mill, on the river six miles above this city, are preparing to put in ten new stamps in tbeir mill. They are now dropping ten stamps steadily and are taking out exceedingly good ore. With the addition of ten more stamps the output of this mine and mill will be more than double its present capacity. Tom Foster and Frank Satterlee are doing the amalgamating at the mill.

Sierra.

TO START UP.—C. K. Harrison, W. G. Harrison, C. Helman, W. H. Armstrong, Jr., J. Rosenerantz and J. H. Cook, of San Francisco, the principal owners of the El Capitan mine, about a mile from Alleghany, are there to inspect tbe mine and make arrangements for starting up. The mine has been idle all winter, but the superintendent, W. H. Armstrong, Jr., has made a favorable report.

Siskiyou.

MINING NOTES.—*Journal:* N. Lamb is putting up a prospecting quartz mill on Yreka creek, near foot of Miner street, with capacity of five 650-pouud stamps, which will prove beneficial to quartz miners on Greenhorn creek, Humbug gulch, Yreka flats and Hawkinsville.

Wademan & Williams have a rich ledge of quartz on Greenhorn creek, which has been paying well.

The Mint quartz mine on Humbug gulch, owned by Herr and Van Nader, continues to show good prospects.

Corbyn & Co., on the north fork of Salmon river, have thirty hands at work building a new ditch and expect to have it completed for use in a short time, in supplying giants with an abundance of water to sluice down banks of auriferous clay and gravel. On the south fork of Salmon river extensive operations are in progress for developing rich placer diggings, and also on the various small tributaries and gulches, all being better supplied with water this season than for many years past.

The Eastlick brothers at Oro Fino are busily at work with their giants in piping down rich paying banks, with certainty of an extensive yield when a cleanup is made. They have plenty of water to run day and night, and have an electric light plant, which proves highly beneficial in carrying on the night work.

Songer & Dame have completed the fixing up of their machinery and apparatus for working the McConnell & Quinne river claims in the Klamath, near the mouth of Humbug creek, and are now crowding operations day and night without any intermission, by employing a large number of hands for day and night shifts. The engine used for the derricks and pumps is of 25-horse power, and lifts a steady stream of sixty inches for the sluices, in addition to working the seepage pump for keeping the claim dry, and also operating the electric light plant illuminating the claim at night.

Austin & Co., of the Greenhorn blue gravel mine, near Yreka, find the pay improving and the gold coarser as the tunneling extends westward, or up the creek. The average yield is about $1000 a week, but the prospects, with the good supply of water at present, give assurance of still better pay.

The Schroeder quartz mine at Deadwood is paying handsomely, and the enterprising owner is working a large force of hands in getting out quartz to keep the mill running steadily without intermission.

The claim of Antone Brazil & Co., near the Espey & Co. mine at Hawkinsville, has been paying handsomely of late. At the last cleanup a nugget weighing 4¼ ounces and worth $77 was taken out, also several nuggets of $10, $8, and smaller sizes, all the gold realized consisting of coarse grains.

The Spangler brothers, of Humbug creek, have a large extent of ground stripped for working, and will commence sluicing pay gravel this week, with prospects of success.

Several claims have been located between Hawkinsville and the Shasta river, in consequence of rich prospects found, and the construction of the new flume from Shasta river by Espey & Co., supplied by a 200-horse power pump raising the water over 500 feet from the river to the summit of the hill above Hawkinsville. The stockholders of the Espey Co. have also located several claims in the same locality in addition to claims purchased.

Crooker Bros. are making preparations for an extensive run at their river mine near Williams' ferry, at the old stage road crossing.

The American Bar miners, farther on down the river, are also preparing for extensive operations. This claim is owned by J. C. Bayer, of Portland, and has been a paying proposition from the start.

The Imker quartz mine, near Honolulu, owned by Chas. Imker, of Yreka, and which he has been working for several years, has gotten onto a paying basis. A five-stamp mill is in steady operation on this property.

W. H. Smith is having good success in his hydraulic mine at Henley, and is working it night and day.

Ben Reeder, who has taken out from $8000 to $10,000 with a hand mortar at his quartz ledge in the Fool's Paradise district, is getting ready to do more development work on the claim, which, as the returns show, yields some remarkably rich rock.

OPERATIONS SUSPENDED.—*Tidings:* The extensive operations that have been carried on at the Black Jack mine, near Hornbrook on the Klamath river, were closed down last Friday, for the present at least, and all but four of the thirty to thirty-five men who had been employed were discharged. This mine, which is a gravel deposit similar to the Jillson mine adjoining, was originally owned by Messrs. Cooley, Ryan and Burckhalter, and bonded by them to R. L Dunne, who had enlisted the interest of a Michigan capitalist of ample resources in the proposition. The latter had furnished the money for development, which had been carried along at a lively rate the past few months under the superintendence of Mr. Dunne. A couple of weeks ago the Michigan capitalist and his private secretary come out to look at the proposition, and their week's stay resulted in the shutting down of work. It is estimated that some $15,000 has been expended in development work, and mining men say the proposition never looked more promising. Supt. Dunne is confident that plenty of capital can easily be secured to develop such a property, and that operations will shortly be resumed on an extensive scale. Two main tunnels have been run in on the claim, No. 2 being in 300 feet, besides extensive upraises and inclines that have been made. The mine was just getting equipped splendidly for work, having had convenient buildings nicely fitted up. A small stamp mill is in good working order, fitted with first-class power. An electric light plant is on the ground, but had not been set up yet when work was suspended. Considerable of the rock had been milled and gave good returns.

Trinity.

A RICH STRIKE.—*Democrat:* The Brown Bear Mining Company of Deadwood were making preparations last fall to abandon the mine. The mine has already been practically abandoned twice. A tunnel was being run to crosscut the ledge at a depth of some 400 feet last week, and a four-foot vein of $100 ore was cut at a depth of 400 feet from the surface that mills over $100 per ton. This mine has yielded over three and one-half millions in

gold and now has as much more practically in sight.

Tuolumne.

THE UPPER BELT MINES.—The Lady Washington shows the vein coming in again prospecting well in free gold. The Draper-Whitto is being cleared out and put in shape for active work. The shaft at the Seminole Cons. is 175 feet deep; the mill is running on pay ore. The North Fork mine shows well and gives promise of good return.

THE MOTHER LODE MINES.—The Rawhide continues a steady producer from the 500 and 600-foot levels. The Gem is being steadily worked, the ore paying $7.50 a ton in the 10-stamp mill. The Alabama is idle, though the large quantity of low-grade ore would justify the erection of suitable works thereon.

NEVADA.

LINCOLN CO.

Record: Shipments of ore are being made to the Phœnix Reduction Co.'s works from the Advance mine, situated about twelve miles from Bullionville in Panaca district. A test run by the cyanide process will be made of the ore.

ARKANSAS.

The deal which has been on for some time past with the English syndicate has been closed at Little Rock. It involves the Morning Star mine, and a large tract in Marion county. The purchase price is $300,000.

COLORADO.

A LARGE CAPITALIZATION.—The Blue Bell Mining and Milling Co. have given a bond and lease on their Hobo claim to Denver parties for $50,000. It will be incorporated into a company which will be capitalized for $1,000,000.

IDAHO.

GOLD NUGGETS.—The report of the finding of a large quantity of gold nuggets by miners at work on the Sturgill bar, has been confirmed by a letter from J. A. Wright, of Sparta, who writes that a peck or more of nuggets were picked up by the men at work. Only the nuggets were taken, and as much more coarse gold is said to be lying on the bedrock, which will be taken out when a clean-up of the sluices is made.

The old channel of Snake river lies about 100 feet above the present water level of the stream. Previously miners had carried on their work on bars lying between the high and low-water mark of the river. The Sturgill bar find has caused great excitement among miners of that locality, and the old channel of the river will be prospected.

THE POORMAN.—*Avalanche:* The company operating this famous old War Eagle property has recently been re-organized, and the name changed from "The Poorman Consolidated Mines Ltd.," to "The Poorman Gold Mines Ltd." With the change in name then is also a change in management, Arthur Grothe, of Payette, being now general manager of the mines for the London stockholders, and Mr. Anderson, of Montana, the superintendent in charge. The new men have assumed control and have begun active work on the property. At present the work is confined to prospecting, sampling, surveying and re-timbering the old workings and ore bodies to find out "where they are at." The Oro tunnel will be driven ahead and connections made with the South Poorman tunnel, for the purpose of ventilation, etc., and the Belle Peck drift will be put in shape and used for the main working tunnel. The management has decided to remodel the Leonard mill, on Jordan creek, put in five more stamps, a new engine and boiler, four six-foot Frue vanners, and copper plates. The power will be sufficient to run an additional ten stamps at any time the output from the mines demand.

A wire-rope tramway will be constructed from the mines to the mill at once, which will greatly lessen the cost of transportation. Four men are now employed at the mill, tearing out the old machinery and preparing for the new.

AN IMPORTANT FEATURE.—The new tunnel which is being started to intersect the Standard vein, and which will eventually be the main working tunnel of the mine, is a feature of vast importance to this region. The mere fact of the commencement of such an expensive undertaking at a time when lead and silver are about as low in price as ever they have been known is sufficient index to the great value of the property and the high estimate placed upon it by its owners. For the next eighteen months the work will have to be continually prosecuted in order to reach the lode, which will be encountered at a distance of from 2,500 to 3,000 feet from the place of commencement. The tunnel will be about six feet wide and six feet high, the intention being to employ mules for hauling the cars. The point selected for the tunnel is not over 150 to 200 feet from the Northern Pacific railroad. A five machine-drill compressor has been ordered, and as soon as this arrives and is in place the tunnel will be driven in as rapidly as possible. It will intersect the Standard vein at a depth of 420 feet below the Banner tunnel, which is the present lowest level of the mine.

OREGON.

UNION CO.

A Union dispatch says: Messrs. Mills and Reed have just bonded their quartz-mining claim in the Bonanza basin, in the Cornucopia district, in the eastern part of the county, to Eastern capitalists, for the sum of $40,000. The purchasers will arrive in a few days and commence mining operations on an extensive scale.

UTAH.

A UTAH INCORPORATION.—*Tribune:* The Goldsmith Coal-Bank Gold and Silver Mining Company has incorporated to acquire, develop and operate mines and water rights, including coal, stone, clay lands, farms, reservoirs, canals, ditches, flumes and other real estate. The stock is divided into 1,000,000 shares, par value, $1 per share.

The incorporators have conveyed to the corporation coal lands and claims in Emery county known as the Muddy mine, the Coal-Bank mine, the Cliff mine, the Rock Canyon mine, the Dodge mine and the Stapley mine. In Millard county the Last Lad, Amy, Big Horn, Spanish, Richford, Thorne, Dodge, Big Horn No. 963, Swazy, McCornick, Yellow Bank and Busby and all the water, timber and road right locations. The directors and officers for the first are John H. Thorne, president; James M. Smith, vice-president; Ernest W. Salt, treasurer; Thomas Kune, secretary; Seth Dodge, superintendent.

The company proposes to commence development work on its mines at once.

MERCUR DISTRICT.—The plant with which the Mercur Company will hereafter refine their product is being built. The company expects to save the cost of transportation and working charges and a higher per cent of the value of the product, amounting to $4000 monthly.

SOUTH DAKOTA.

SPEARFISH CREEK.—*Pioneer:* Although there is but little excitement over the late find on Spearfish creek, there is a good body of silicious ore there which will average from $14 to $40 a ton, and a number of men are hard at work.

WASHINGTON.

HORSESHOE BASIN.—*Lake Chelan Leader:* Up to 1892 about 300 mineral claims had been located, mostly in Horseshoe Basin and near the summit of the Cascade range, where the headwaters of the Stehekin river, which flows into Lake Chelan, have their source. During 1892 prospecting and developing prospects already made were pursued with renewed energy, no less than 1000 mining men being on the ground from May to November, and during this time about 1500 mining claims were located in this region.

The general trend of these vast mineral lodes is northeasterly and southwesterly, which is about the direction of the Cascade range in this locality.

The terrific work of past glacial action in this region has so torn and carried away the sides of the mountains as to leave exposed to view extensive veins of mineral which can be readily traced by the veins themselves and unmistakable surface indications for two or three miles up and down the bare, gray and red peaks and through the intervening basins and passes. The general character of these vast ore deposits is galena, varying from 50 to 200 ounces of silver to the ton, and averaging nearly 75% in lead.

MONTE CRISTO DISTRICT.—Twenty-five men were put to work in the Mystery mine within the past few days. The concentrator has started and will treat 100 tons of ore a day. Shipments of concentrates have begun.

California Miners' Association.

Executive Committee Meeting.

An important meeting of the Executive Committee of the California Miners' Association will be held in Parlor A, Palace Hotel, San Francisco, on Thursday, June 6, 1895, at 8 P. M.

It is highly desirable that there shall be a full attendance at this meeting, and this notice is sent some weeks in advance in order that members of the Committee residing in the interior may make the necessary arrangements to be present. Representation is wanted from each county in the organization, and unless the members properly delegated attend their counties will be unrepresented. You are therefore urged to make every effort to be present, as we wish a full meeting.

The views of all the members are wanted on the "Mineral Land and Railroad" question in order to definitely determine the course to be taken by the Association in this important matter. A great deal has already been accomplished through the special committee on "Protection of Mineral Lands," but a free expression of opinion is desired as to what further steps are to be taken by the Association as a whole.

The matter of finances is also one of consequence requiring immediate attention. If the resolutions and instructions of the recent Miners' Convention are to be carried out, the Executive Committee must have funds to carry on the work. As the majority of the members of the Association reside in the interior counties, the prompt financial assistance of those counties is expected; and it is hoped that those who attend this meeting will come prepared to say what may be expected from their respective localities.

It will be noted that some of the papers of the State are agitating a renewal of the old anti-debris contest, notwithstanding the fact that there is now a Federal law regulating hydraulic mining in California, framed for the protection of all interests, and also a Federal Commission having authority under said law to permit or prevent the working of said mines, as the interests of the public require. These papers are also making an effort to bring the quartz and drift mines into the same category as hydraulic mines. All such attempts must be met by the united forces of the miners of California if they wish their industry to prosper. To this end the California Miners' Association must continue its efforts in behalf of the mining interests. All these matters will be discussed at the meeting of June 6th, and all members of the Executive Committee are urgently asked to be present.

CALIFORNIA MINERS' ASSOCIATION.
J. H. NEFF, Pres. WM. C. RALSTON, Sec'y.

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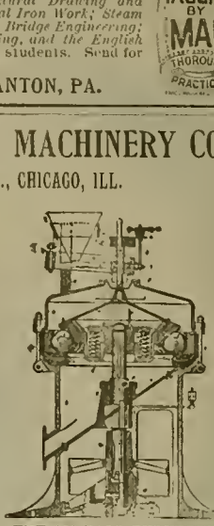
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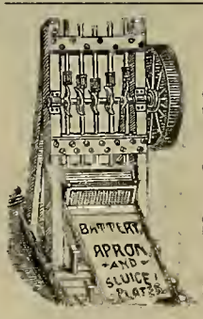

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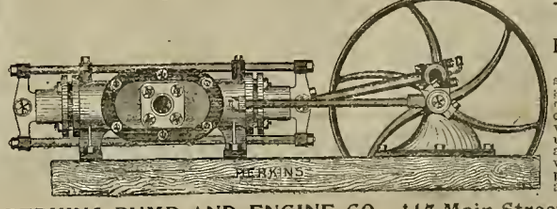

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NUMBER XXVIII.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

Humboldt County.—Natural gas occurs at Petrolia and at upper Mattole. It rises in bubbles in the bed of Mattole river. Nearly all the wells sunk for oil in early times yielded more or less gas.

While the tunnel on the line of the Eel River and Eureka railroad was being driven, escaping gas in the cuttings caused the workmen much annoyance and trouble.

"In 1868 W. H. Green and associates were sinking a well near Hydesville Suddenly an explosion took place. The well is said to have 'blown up;' the pipes were thrown out and the well ruined. Accidental ignition of natural gas was the supposed cause."

In October, 1893, I visited a flowing artesian well at the sawmill of Flanigan & Brosnan, in Eureka. It continually flows about an inch of water, which has a decided mineral taste. It is sold and largely consumed under the name of the "Humbolt mineral water." A small quantity of bubbling gas comes up with the water, which can be ignited, but it does not escape in sufficient quantity to burn continuously; generally a flash only follows the application of a lighted match. If the small side aperture through which the water flows is closed, the water in the pipe rises and overflows. This is in all respects like the Stockton gas wells to be described, except that both the flowing water and gas are less in quantity. This well was sunk about 1877, as nearly as I could ascertain.

On Bear river, at the Odell place, and at Wicks' ranch, gas escapes naturally from crevices in the earth. At Wicks' it once burned for several years. The flame burned like brandy and rose but a few inches above the ground.

I was informed by Mr. William Ayres of Eureka that near Bear river, about a mile and a half up a side gulch from the river, and four or five miles from Cape Town, there is an area of from 50 to 100 square feet over the whole surface of which gas rises and can be ignited; it once burned for four years.

Cape Town was formerly a whaling station and was called "Gas Jet," because the whalers used to try out their oil by the heat of burning gas, which they conducted beneath their kettles. Cape Town lies on the coast about three miles N. N. E. from Cape Mendocino.

Kern County.—In the report of the Buena Vista Petrolcum Company, made in 1866 by E. Benoist, after describing the oil well being sunk, he adds: "Had the requisite machinery been at hand, I should have gone to a greater depth, but deemed it to be inadmissible to do so at this time, as the quantity of gas issuing would make it difficult to prevent ignition of the oil, which circumstance in your case, when it is so abundant, would entail serious loss."

The following is an excerpt from the San Francisco *Chronicle* of unknown date: "In a well sunk for oil in Kern county, when at a depth of several hundred feet, a deposit of gas was struck. The flow was so strong that the heavy drilling tools were sent flying into the air over the top of the derrick, accompanied by a shower of stones, fragments of casing and other debris. About the well was a layer of large three-inch planking which had been used in forcing the casing into the earth. The force of the gas explosion tore a hole three feet in diameter through the three inches of solid wood, leaving the edges as sharply cut as if done with an ax." This was probably the Columbia well at Buena Vista, elsewhere referred to.

Lake County.—This county is noted for the solfataric region which lies within its borders. The sulphur bank, the great gas spring in Clear lake, the hot ammoniacal spring, the obsidian hills, sulphur fumerols and the Borax lake, are evidences of strange metamorphoses taking place below the surface. Emanations of carbonic acid, hydrosulphuric acid, sulphurous acid and hydrocarbon gases are all met with at numerous localities.

In 1878 Mr. J. S. Jamison, in a letter to the Sacramento *Bee*, described a gas-emitting mound near Kelseyville: "This mound is on the eastern boundary of the town, on a slight elevation. The mound covers one and a half acres, and gas escapes over the whole surface and can be lighted with a match, when it will continue to burn for hours and the light can be seen for a long distance at night. Several shallow wells were sunk on it by which the flow of gas was considerably augmented. A perforated tin can placed over the opening burned for several days. A pipe laid for twenty feet or more and connected with a cooking stove furnished enough gas to cook vegetables." This gas was discovered ten or twelve years before. It burned at any and all seasons of the year, but was thought to give a brighter light in the winter and spring.

Los Angeles county.—In sinking a well at Los Angeles in 1885 a flow of gas was obtained.

The following from the Los Angeles *Herald* of uncertain date probably refers to the above item, taken also from a newspaper:

"*Another Great Discovery.*—Yesterday, as Don Francisco Ruiz was digging a well on Pico street extension near the schoolhouse, on the Monte Vista road, the workman in the bottom of the well—Erasmus Durand—struck a vein of hydrogen gas that took fire from a cigarette and blazed up to a height of ten feet above the well and is still blazing. Mr. Durand was hauled out of the fiery furnace as soon as possible, but in the ascent was terribly burned in his hands, while his hair was singed off. This is a most valuable discovery for the southwestern part of the city, and should be utilized at once. The University can be lighted and heated by this well. * * * There should be a dozen wells sunk as soon as possible inside the city limits. There are now two west of the city line and many gas springs inside the city. Why are they not utilized? The cable road can propel its engine from gas that is formed beneath its track and is here and there leaking out of the rifts in the rocks to fly away into the atmosphere. All this enormous wealth should be utilized without delay. Who will open these wells of wealth and reduce the cost of fuel to one-half its present price?"

A reporter of the Los Angeles *Times* has been "doing" the San Fernando oil wells. If his statements are correct, which the *Alta* has no reason to doubt, the oil interests must be growing to an extent which is almost inconceivable. * * * He adds "that the first thing observable when darkness came on was that the city was lighted by gas, and this led to the further discovery that the cooking was done and the rooms heated and the engines run all without any other fuel than that obtained by introducing the end of an iron pipe into one of the oil wells and making connections with such places as required lighting and heating." (Excerpt from San Francisco *Alta California*.)

"Natural gas has been struck near Los Angeles. It is pouring out in large quantities under high pressure and appears to possess all the qualities necessary for heat and power purposes. The well has been bored by I. W. Hellman on his ranch, a mile or so east of Boyle Heights, formerly known as the Repette place." (Newspaper clipping, March, 1892.)

Mendocino County.—In 1873 a spring of natural gas was burning a few miles east of Round valley. From descriptions given, it resembled that of Sulphur Creek, Colusa county.

(*To be Continued.*)

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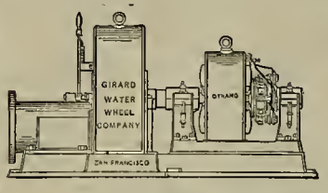

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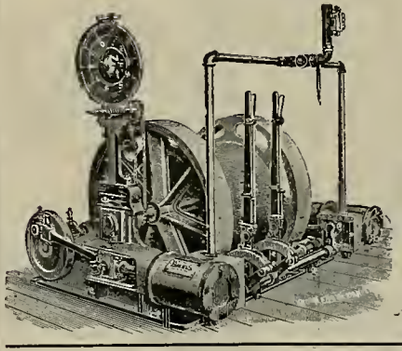

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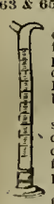

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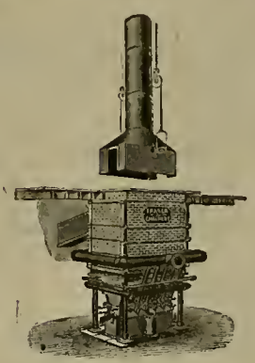

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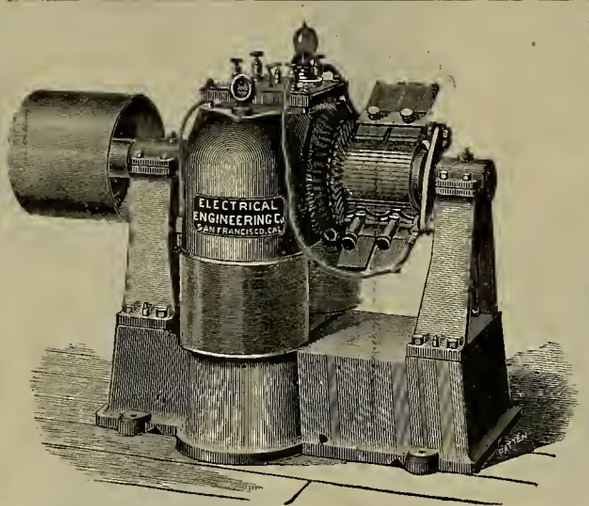

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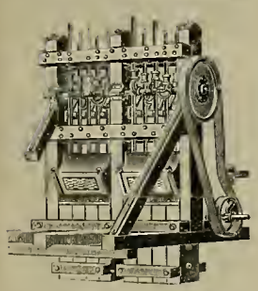

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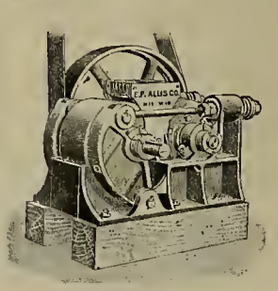

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Market Reports.

The Markets.

SAN FRANCISCO, May 16, 1895.

An agreement has been arrived at with the representatives of American mines in London by which the export copper from the United States during 1895 will be restricted to a certain fixed amount, which is somewhat below the exports of 1894. At a meeting in that city last Wednesday of the representatives of the American copper producers it was decided to restrict the shipments to 60,000 tons for a year. The European producers agree to reduce the output of copper seven per cent.

The British are to coin a silver dollar for use in Hong Kong, the Straits Settlements and the far east generally, where the Mexican dollar has long been the standard coin.

It is as yet undetermined whether the China loan will be negotiated in London or Berlin. Indications favor the latter.

Local metal markets show higher quotations throughout.

New York Metal Market.

NEW YORK, May 16.—PIG IRON—Scotch, 19@20c; American, 9.50@12.00c.

COPPER — Brokers', 10.25c; exchange, 10.50c.

LEAD—Brokers', $2.95; exchange, $3.20.

TIN—Straits, 15.20@15.25c.

SPELTER—Domestic, $3.45.

New York Silver Prices.

NEW YORK, May 16.—Following are the closing prices for the week:

	—Silver in—			
	London.	N. Y.	Copper.	Lead.
Friday	30¼	66⅛	10 25	.....
Saturday	30⅝	66¾	10 25	3 20
Monday	30⅞	67⅛	.....	.....
Tuesday	30¾	66⅞	.....	.....
Wednesday	30¾	66⅞	10 25	3 20
Thursday	30½	66½	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	5
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.87
London Merchants	$4.85
London Sight Bankers	$4.88
Refined Silver, per ounce	67c
Mexican Dollars, nominal	54

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	½ & 5-16, 17c; ⅜ and larger, 16c		
Lake Superior Sheathing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17
TIN PLATE.			
Per bx	5 25	@	6 00
PIG TIN.			
Per lb	15	@	16 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Homs trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 75
Nanaimo			6 50
Gilman			6 00
Seattle			6 25
Coos Bay			5 50
Cannel			10 50
Egg, bard			12 50
Wallsend			7 50
Scotch Splint			7 50
Brymbo			7 50
West Hartley			8 75
TO ARRIVE—PER TON.			
Australian	5 85	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	15 00	@	— —
Cumberland	11 00	@	— —
Egg, hard	12 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'			75c ₱ bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00
NAILS.			
Wire			$1 75
Cut			1 55
ZINC.			
Sheet	8¼@		

Mining Share Market.

SAN FRANCISCO, May 16, 1895.

The bears set the pace and made the market during the week, and the little that was done was at low figures. The stagnation in the stock exchange is in strange contrast to the activity elsewhere.

The London *Financial News* says: "The market for mining shares grows stronger and more active every day, and the business that is now being done far exceeds anything ever before known either here or in any other stock exchange. As fast as profits are taken in one stock they are re-embarked in some other, and so the area of speculation continues to widen, and securities long neglected come into new life and prominence. The business has outgrown the capacity of the Stock Exchange machinery and the powers of endurance of the members and their clerical staffs, notwithstanding the all-day work and the frequent all-night work in the offices of the leading dealers."

The London *Standard* says: "Men have gone so mad about 'mines' that they are actually trying, in some instances, to buy the shares of companies which have been liquidated years since."

The following illustrates the changes of the week:

MINES.	9	16
Alpha	$ 08	$ 05
Alta Consolidated	..	08
Andes	18	15
Belcher	56	49
Best & Belcher	70	59
Bodie	1 10	1 00
Bullion	14	.....
Challenge	34	25
Chollar	.....	25
Confidence	.....	1 10
Consolidated California and Virginia	2 85	2 80
Consolidated New York	.....	.....
Crown Point	48	45
Excbequer	02	.....
Gould & Curry	.....	30
Hale & Norcross	.....	1 20
Justice	.....	.....
Mexican	69	55
Ophir	1 65	1 60
Overman	09	17
Potosi	41	32
Savage	26	16
Sierra Nevada	70	64
Union	46	39
Utah	.....	.....
Yellow Jacket	28	47

San Francisco Stock Board Sales.

SAN FRANCISCO, May 16, 1895.

9:30 A. M. SESSION.

200 Andes	15	750 Mexican	55
50 Bodie	1 00	400 Occidental	17
100 Challenge	25	500 Ophir	1 60
1100 Chollar	25	300 Overman	17
200	24	100 Potosi	32
350 Crown Point	45	100 S B & M	14
400 Con Cal & Va	2 80	300 Sierra Nevada	63
100 G. & C	30	100 Union	38
500 Hale & Norcross	1 20	400 Yellow Jacket	47

SECOND SESSION—2:30 P. M.

500 Alpha	05	250 Mexican	54
100 Alta	08	100 Mono	12
400 Andes	15	450 Ophir	1 60
400 Belchsr	49	200 Overman	17
300 Best & Belcher	59	100 Potosi	32
1000 Chollar	24	600 Savage	16
350 Con Cal & Va	2 80	150 S. B. & M.	15
100 Confidence	1 10	150 Sierra Nevada	64
50 Gould & Curry	29	300 Union	39
1200 H & N	1 15	300 Yellow Jacket	46
100 Kentuck	03		

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628 Sacramento St.....San Francisco.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Alta M Co, Nev	49	10c	May 6, Jun 11, July 2	J E Jacobus, 309 Montgomery
Andes S M Co, Nev	41	15c	May 1, Jun 1, Jun 17	J W Twiggs, 309 Montgomery
Cbollar M Co, Nev	40	25c	May 14, Jun 15, July 11	C E Elliott, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19, May 31, Jul 26	J Henry Smith, 431 California
Justice M Co, Nev	59	10c	May 7, Jun 11, Jun 28	R E Kelly, 309 Montgomery
Mexican G & S M Co, Nev	53	25c	May 13, Jun 17, July 10	C E Elliott, 309 Montgomery
Ophir S M Co, Nevada	65	25c	April 4, May 7, May 27	E B Holmes, 50 Nevada Block
Overman, Nev	73	10c	Apr 15, May 21, Jun 11	Geo D Edwards, 414 California
Savage M Co, Nevada	86	20c	Apr 19, May 22, Jun 11	E B Holmes, 309 Montgomery
Yellow Jacket, Nsv	59	25c	Apr 15, May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Crown Point G & S M Co, Nev	Jas Newlands, 35 Mills Building	June 3
Gold Ridge Con M & M Co	R H Daley, 216 Post	May 20
Seg Belcher, Nev		June 4

Assessment Notices.

OVERMAN SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of April, 1895, an assessment, No. 73, of ten cents (10c.) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of May, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 11th day of June, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. D. EDWARDS, Secretary.

Office—No. 414 California street, San Francisco, California.

H. P. TAYLOR MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Liberty Mining District, Siskiyou county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the nineteenth day of April, 1895, an assessment of Four (4c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, 39 Merchants' Exchange, 431 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the thirty-first day of May, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on FRIDAY, the twenty-sixth day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HENRY SMITH, Secretary.

Office: 39 Merchants' Exchange, 431 California St., San Francisco.

ALTA SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of May, 1895, an assessment (No. 49) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 11th day of June, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on TUESDAY, the 2d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. E. JACOBUS, Secretary.

Office, Room No. 33, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

ANDES SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia City, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the first (1st) day of May, 1895, an assessment (No. 41) of Fifteen (15c) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Rooms 20-22 Nevada Block, 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the first (1st) day of June, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on MONDAY, the seventeenth (17th) day of June, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JOHN W. TWIGGS, Secretary.

Office—Rooms 20-22 Nevada Block, San Francisco, California.

ANNUAL MEETING.

The Regular Annual Meeting of the Stockholders of the Gold Ridge Consolidated Mining and Milling Company will be held at the office of the Company, No. 216 Post street, San Francisco, California, on Monday, the 20th day of May, 1895, at the hour at 3 P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such business as may come before the meeting.

Transfer books will close on Friday, May 17, at 1 o'clock P. M. RICHARD PHELAN, President.

R. H. DALEY, Secretary.

Office, 216 Post St., San Francisco, Cal.

ALBERT MALTMAN, Practical Metallurgist and Engineer.

SAMUEL C. THOMPSON. A. B. Yale University. E. M. Columbia University.

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References:

Timothy Dwight, President Yale University, New Haven, Conn.

Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.

Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.

Edward M. Preston, President Citizens' Bank of Nevada City, California.

Professional Cards.

A. H. RICKETTS, Attorney-at-Law, Mining Patents and matters before the Land Department a Specialty. Crocker Building, Rooms 201, 202 and 203, San Francisco.

The Evans Assay Office.

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Dr. Willis E. Everette, 1141 R. R. Ave. Tacoma, State of Washington, U. S. A.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING MAY 7, 1895.

538,889.—Compass Deviations—J. A. Arvidson, S. F.
538,721.—Car Fender—H. A. Benson, Oakland, Cal.
538,727.—Lawn Sprinkler—J. Byler, Los Angeles, Cal.
538,806.—Gravity Valve—Cavalluro & Sturm, San Jose, Cal.
538,819.—Current Motor—J. W. Cover, Everett, Wash.
538,930.—Door Opener—L. Dunn, S. F.
538,831.—Safety Valve—T. W. H. Inizelman, Sacramento, Cal.
538,843.—Road Cart—G. J. Overshiner, San Diego, Cal.
538,881.—Ore Crusher—A. H. Schierholz, S. F.
538,885.—Steam Boiler—E. Shydecker, S. F.
538,758.—Preventing Electrolysis of Street Pipes—J. W. Guthrie, Sacramento, Cal.
538,901.—Plow—C. B. Williams, S. F.

Note.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press U. S. and Foreign Patent Agency, the following are worthy of special mention:

Rock-Crushing and Grinding Apparatus, J. H. Kinkead, Virginia City, Nev. No. 538,523. Dated April 30, 1895. This invention relates to improvements in rock-crushing and grinding apparatus. It consists of a pan having a conical bottom declining outwardly from the center, sides extending upwardly at right angles with the bottom, a pan-shaped muller having a conical bottom and diverging sides, said bottom having a concavity slightly less in depth than the corresponding convexity of the bottom of the pan, the muller being entirely open on its top whereby its sides and bottom form a deep receiving chamber into which the ore to be crushed is delivered, said bottom provided with openings which are covered when the bottom of the muller forms close contact with the corresponding grinding face of the pan, and opened or exposed when the muller lifts away from said grinding face, whereby the ore is automatically fed through the openings during the gyrations of the muller, and is delivered directly to and crushed between the bottom surfaces of the pan and muller. A driving shaft extends upwardly through the center of the muller and has a crank connecting loosely with it so as to gyrate the muller about upon the bottom of the pan, and screen openings are fixed around the sides above the edge of the pan for the discharge of the material when sufficiently crushed.

Fan Attachment for Rocking Chairs.—Joel Weigel, San Francisco, Cal. No. 538,566. Dated April 30, 1895. This invention relates to that class of fan attachments for rocking chairs, in which the movement of the chair is imparted to a vertical shaft, by the rotary motion of which the fan or fans are operated. The object of the invention is to simplify the construction of this class of devices, and render their operation noiseless and generally more positive and efficient. The device consists of a shaft having a spiral end, a non-metallic nut through which said end passes whereby the engagement of the spiral shaft and nut is a noiseless one, a housing for the nut having an opening through it of greater diameter than the diameter of the shaft, whereby a rocking movement is permitted the shaft in addition to its axial movement, and a means for connecting the shaft with the back of the chair.

Apparatus for Showing Compass Deviation.—J. A. Arvidson, San Francisco, Cal. No. 538,889. Dated May 7, 1895. This invention relates to an apparatus which is designed to show the deviation of magnetic compasses and is especially applicable for the adjustment of such deviation so that the courses sailed by the ship can be accurately determined at all times when heavenly bodies are visible. It consists of a time circle journaled in standards which are supported and turnable, in conjunction with the compass suspending mechanism whereby the compass card is maintained in an essentially horizontal position; a latitude and declination circle fixed to the lower side of the ring at right angles with its journals, with an index and clamp for adjusting and holding it; a disk rotatable within the time ring having an opening made transversely across it; an observation tube journaled in the opening in the rotatable disk so as to turn transversely thereto, and an index point on the plane of movement of the observation tube adapted to coincide with the apparent time when the observation is taken.

Ore Crusher.—August H. Schierholz, San Francisco, Cal., assignor to the Risdon Iron and Locomotive Works. No. 538,884. Dated May 7, 1895. The object of this invention is to provide a means intermediate between the driving gear upon the fixed vertical shaft of an ore crusher and the table or carrier upon which the horizontal roller shafts are journaled, by which means the rollers are caused to travel upon the dies, this intermediate connection being of such a nature that it will compensate for all irregularities of movement and vertical rise and fall of the rollers as they pass over the material to be crushed without in any way conveying these motions to the driving mechanism. It consists of an annular pan with peripheral dies, rollers adapted to travel upon said dies to crush the material placed thereon, a vertical central fixed shaft with a gear-wheel loosely turnable upon the upper portion above the pan, a horizontal shaft and pinion whereby said gear is turned about the central shaft, vertical pins fixed to the hub of the gear or extension thereof, bulls through which the pins are slidable and hemispherical boxes fixed to the central horizontal table so that the pins act to rotate the table around the vertical shaft and prevent contact between the two. In conjunction with this are journal-boxes fixed to the table within which the horizontal shafts of the crushing rollers are journaled. The connection of the pins and driving mechanism is self-adjusting, and thus allows for the wear of the shoes and dies.

Gravity Valve and Vacuum Relief.—F. Cavalluro and J. N. Sturm, San Jose, Cal. No. 538,806. Dated May 7, 1895. The object of this invention is to provide a convenient and ready means for the delivery of any desired quantity of water from a stationary tank to a watering cart or other receptacle, to close the valve perfectly when the receptacle is filled and to allow the water remaining in the discharge pipe beyond the valve to escape freely and rapidly, and to allow the valve to be easily removed or replaced without emptying the tank. It consists of a valve seat with a discharge pipe leading therefrom; a conical valve fitting said seat; a tube extending up through the valve to a point above the tank to admit air into the space below the valve when the latter has been closed to prevent a discharge of water. This air allows the water remaining in the pipe below the valve to flow out rapidly. The valve seat is fitted with a flange so as to be bolted to the side or bottom of the tank, and the inside is screw-threaded to receive the corresponding threaded end of the discharge pipe, thus allowing the latter to be easily removed and replaced. The tube extending down through the valve and reaching to a point above the top of the tank is suspended by a hook or other means from a lever arm so that by pulling the cord upon the opposite end the valve may be opened, and by releasing the cord the valve may be closed. The valve has slides adapted to move on suitable vertical guides to keep it in place, and it may be easily raised entirely out of the tank, if it is desirable to do so for any purpose.

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The work, like Mr. Aaron's former publications ("Testing and Working Silver Ores," "Leaching Gold and Silver Ores") that have been "successfully popular," is written in a condensed form, which renders his information more readily available than that of more wordy and less conscientious writers. The want of such a work has long been felt. It will be very desirable in the hands of many.

Table of Contents:—Preface; Introduction; Implements; Assay Balances; Materials; The Assay Office; Preparation of the Ore; Weighing the Charges; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

The volume embraces 130 12-mo pages, with illustrations, well bound in cloth; 1893. Price $1.00 postpaid. Sold by the Mining and Scientific Press, 220 Market St., San Francisco.

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Table of Contents:—Gold and Silver Bullion; Apparatus; Melting Bullion; Assaying Bullion; Humic Assay of Silver; Gay Lussac's Method; Volhart's Method; Manipulation; Lead Ores; Copper Ores; Tin Ores; Mercury Ores; Zinc Ores; Nickle and Cobalt; Chromium; Bismuth; Arsenic; Antimony; Sulphur; Salts; Note.

One of the methods given for the Assay of Copper is new, original and exact, as is also one of the processes for Zinc.

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 21. SAN FRANCISCO, SATURDAY, MAY 25, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

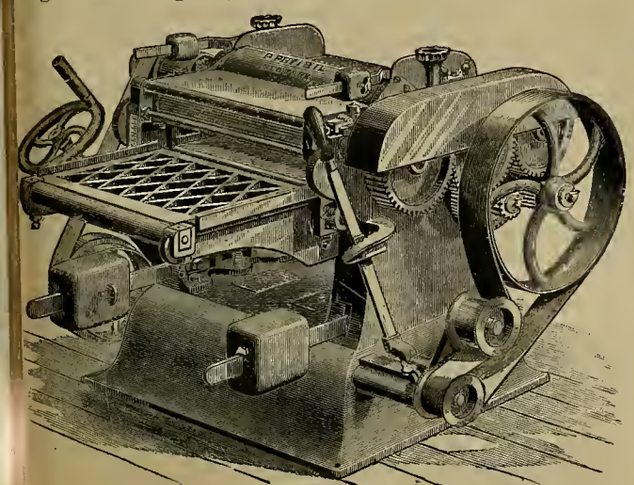
An Obvious Distinction.

The London *Mining Journal* of the 4th, in an effort at editorial rejoinder to a recent paragraph in this paper about the "Kaffir circus," completely misses the point. It would be an insult to the intelligence of that journal to assume that it failed to note that this paper's objections were not against any promulgation of South Africa's gold wealth. Hence it is fair to infer that the *Mining Journal* ignored the direct point made, which was that it was with surprise was seeu editorial endorsemeut of speculative and meretricious miuing schemes of questionable origin. Of course, if the *Mining Journal* wants to editorially endorse such schemes it has the right, but it cannot expect to do so and continue to possess the confidence or respect of its readers. It says: "We have exerted ourselves not a little on behalf of California," which certainly does go a good ways toward mollifying censure. Let us hope it will be as sternly censorious and rigidly correct in viewing Randt propositions as it is in other parts of the world.

The *Journal* cannot arouse any jealousy in California by laudations of South Africa, for there can be no rivalry; but the *Journal* well knows that honest accounts of mining operations are quite different from statements of particular properties that tend to create false ideas of value, and it knows equally as well that that is what elicited our reproof.

THE illustration below is of a 26-inch feed planer, made by P. Pryibil, which will plaue ten inches thick. The feed is double, being effected by four live rolls, which are capable of carrying a ¾-inch cut. The back rolls have self-adjusting scrapers, and all are provided with covers which, together with the shaving-guard, can be swung out of the way to give access to the knives, and to enable them to be whetted while in place.

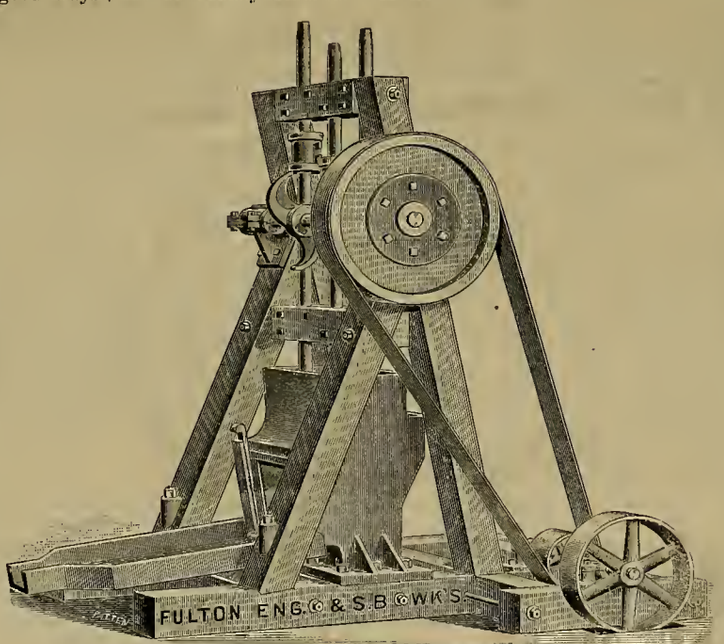
Two pressure-bars, the front one hinged and weighted, are so arranged as to hold the stock down close to the cutter-head, irrespective of the thickness of cut. Adjustment for different thicknesses of stock up to ten inches, is made by turning a single hand-wheel, each turn giving just $\frac{1}{16}$-inch variation. A scale shows at all times the thickness to which the machine is set.



TWENTY-SIX-INCH FEED PLANER.

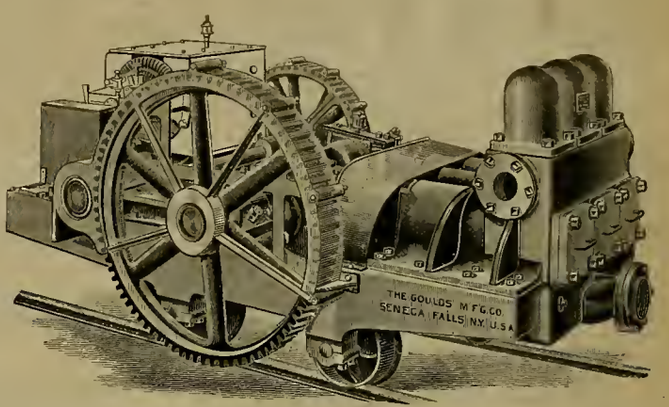
Three-Stamp Prospecting Mill.

The three-stamp mill herewith illustrated is a handy one for prospecting and where a larger and more pretentious plant cannot be readily secured. It is built by the Fulton Engineering and Ship-building Works, and is so arranged that it can be worked by horse, steam or water power. The frame can be taken apart and put together again with no cutting or refitting. The stamps are 90-drop, weigh 250 pounds each, and the entire outfit as shown, including frame, weighs 4500 pounds.



HANDY THREE-STAMP PROSPECTING MILL.

LIVING SPRINGS of white sulphur water on the old Alcalde Leavenworth estate, fourteen miles from Petaluma, recently discovered, have been analyzed and pronounced the peer of any of California's many famous mineral water outflows. An incorporated company will improve the property and establish a sanitarium.



GOULD'S HORIZONTAL TRIPLEX ELECTRIC MINE PUMP.

A New Electric Mine Pump.

The advantages of an electric mine pump are that it can be made of such form as to be easily adapted for use in shallow cuts, easily moved from place to place, can be started or stopped at a moment's notice; is economical in operation and does not require a skilled engineer to operate it. Above is giveu an illustration of Gould's horizontal triplex electric mine pump, manufactured by the Gould's M'f'g Co., a combination of a pump of the triplex pattern and an electric motor, direct geared, mounted on a truck. The pump has three plungers of phosphor bronze, outside packed, attached to the crank shaft by connecting rods at 120° apart. This method of construction permits the plungers to follow each other and overlap, giving a constant flow and securing great efficiency. The cylinders and glands are bronze-lined. The motor and pump gears are of iron, machine cut and motor pinion of bronze. The materials of which this pump is made are unaffected by mine water, and all the exposed parts are duly protected from falling debris by covers. The gears and pinions are machine-cased. The pump is of such design as to be easily adapted for working in shallow cuts.

These pumps are in operation in the William "A" Colliery of the Connell Coal Company, Scranton, Pa., Union Colliery Company, Victoria, B. C., Raybould Coal Company, Columbus, Ohio, and the Albion Iron Works, Victoria, B. C.

IN the 53rd Congress a bill was introduced requiring owners of placer claims to segregate 20-acre lots, but did not pass. There has been no change in the law regarding annual labor on placer claims, which allows a company of eight men to hold 160 acres and considers $100 worth of work sufficient, the intent in these matters being largely taken into account.

THE two most widely separated postoffices in the United States are those in Key West, Florida, and in Ounalaska, Alaska, 6271 miles apart. Two cents will carry a letter between those distant points.

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J. F. HALLORAN.....General Manager

San Francisco, May 25, 1895.

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A COMMITTEE of Oregonians has made an appeal to the people of the Webfoot State to raise $10,000 to be used in the presentation to the battleship Oregon of a suitable testimonial of appreciation on the part of that commonwealth of the compliment involved in the naming of the great war vessel after that great State.

ELSEWHERE Frank McLaughlin answers one of the little squibs now appearing in the valley press. The article which elicits the Colonel's rejoinder is a simple sample of stock on hand, and nothing delights those people more than to be noticed or to have their stuff considered worth answering. Column after column of just such assertions as Colonel McLaughlin disposes of appears every week, dictated, doubtless, from headquarters, and intended solely for local consumption. The writers don't believe it themselves, but hope to revive a prejudice that is fast disappearing.

THE London *Mining World* of May 4th has an editorial interview with Robt. Williams, who is announced as intending to put into immediate operation a new process he has discovered for profitably working "millions of tons of low-grade ore" "outside the main reef" on the Randt in South Africa. From his description of his machine he seems to have in mind a California dry washer. He further says: "We are engaging, at least, two engineers from America at a cost of about 3000*l.* a year each, with their expenses. They are the finest men we can get from California. They are experts in quartz mining, and, while the object of our companies is to waste not a sixpence, we are determined to spare no money in getting the very best assistance, and the most competent advice that money can obtain, for we look upon this as economy in the long run. One of these California men will leave in about three weeks."

THE division of mining statistics and technology of the United States Geological Survey sends advance sheets of its statement regarding the production of coal in '93 and '94, the figures of which emphasize California's meager production. The smallest output of any State in '93 was that of North Carolina—17,000 tons. North Dakota is credited with 40,630 tons; Oregon, 41,683; Michigan, 45,979; California, 72,603. The figures are relatively the same for '94; the same year Pennsylvania produced 98,037,267 tons; Ohio, 13,253,646; Illinois, 8 19,949,564; West Virginia, 10,708,578. The aggregate of the nation's coal product for '93 was 182,352,774 tons, worth $208,438,696; for '95, 170,853,085 tons, worth $186,-154,604. In '94 there were 375,870 men employed in coal mining. The average price per ton ranged from 75c. in West Virginia to $3.87 in Oregon. The price per ton in this State is set down as $2.31.

SOME mouths ago, with well-meant but mistaken zeal, a city contemporary opened up a discussion about hydraulic mining that had been with mutual good will accorded a much needed rest, and since then the opponents of the hydraulic miners have at considerable length iterated and reiterated a great deal that was long ago shown to be baseless; have rehashed many old charges and made a good many statements that have no foundation either in fact or intent. The result is that the harmonious relations existing since the conference at the California Miners' Association meeting in '92 are strained, and considerable undeserved hostility is manifest. It has always been the province and the purpose of this journal to present the facts, invite discussion and conference, encourage mutual understanding, (for in this as in other cases ill-will ofttimes results from ignorance of each other) and, in general, to trust to the good sense and intelligence of all rather than deal in invective or incite harsh and unjust attack. After years of such effort and with the assistance of miner and valley resident alike, a suitable and satisfactory law was passed, competent men appointed by the federal government to administer and enforce the law, and its workings have been uniformly successful. Its provisions have been rigidly enforced, and universally complied with. Where application has been made to the United States Debris Commission for permit to build restraining works and operate by hydraulic mine, immediate and competent examination has been made, notice has been given, advocates and opponents of that particular location afforded opportunity to make statement, and without favor the requested permit has been granted or denied accordiug to the judgment of the Commission, which in no case is to be questioned. No miner has disputed the decisions of the Commission, though the anti-debris people constantly decry their work and impugn their motives, eagerly seeking the most trivial pretext in an attempt to soil what they omit to shiver. At a meeting of the Anti-Debris Association in Sacramento last Wednesday, it was stated by that society's agents that considerable illegal placer mining is going on in Plumas, Nevada and Placer counties. The report is doubtless exaggerated as similar ones have been, the idea being apparently to arouse antagonism and foment opposition rather than adhere to the truth in a statement of alleged facts, but it is probably true that in a few isolated instances in opposition to the efforts of the miners themselves, Chinese have illicitly operated sluices in ignorance or defiance of the law. It is unnecessary to say to the hydraulic miners of the State that strict compliance with the law is required of them no less as a measure of safety than as a moral principle. Every resident of any part of a region in which is located a hydraulic mine draining into the tributary of a navigable stream should constitute himself a committee of one to see that the law is rigidly observed. This has not always been done, but it should be not only a silent precept but an active duty. Especially is this necessary at this time, when everything is distorted and misstated in an effort to manufacture argument against the entire system. Any miner who violates the slightest provision of the law or neglects to comply with its every requirement is an enemy to himself and the cause he represents. It is manifestly impossible to entirely control the actions of Chinese and other irresponsible parties who take desperate chances to win a few dollars, and it is manifestly unfair to make that serve as a text to charge the miners with wholesale disposition to violate the law as has been done recently. In connection with all this, attention is directed to the called meeting of the executive committee of the California Miners' Association on the evening of Thursday, June 6. It is necessary that there be a full attendance, and every delegate is urged to be present; every county in the State should be represented. A good deal has been done by the miners for their interests, and the welfare of the entire State, but considerable remains to be done. Conference and active co-operation will be necessary. Whether justly or not, the railway corporations are credited with a present spirit of reprisal, and in revenge for the activity displayed by the miners in opposing the corporate absorption of the mineral area of the State, the subservient portion of the State press has begun fighting the mining industry, quartz, drift and hydraulic, and it is alleged with great appearance of truth, that this is the real reason for the sudden outburst of antagonism in newspaper offices in Sacramento and elsewhere. It is unfortunate that men who have temporary access to type can be thus swayed by railway influence of various kinds, but it is for the miners of the State to solidly stand up for that which is right, confident of ultimate success.

THE coal importers and dealers of this city have formed a "combine," and arbitrarily advanced the price of coal one dollar a ton. Though there is a decrease in the price of food, rent, labor, and nearly everything else, this article is advanced, apparently for no other reason than because the middlemen imagine they can do it and not be interfered with. They should be shown differently, and given a salutary lesson. The Manufacturers' and Producers' Association is now engaged in a timely effort to advance the industrial interests of the Coast. The price of coal is an important item to every consumer. In the face of this local effort to put local industries on their feet comes this greedy effort, which, if successful, must be repressive to the new movement. Since those who fancy they control the coal market evidently have no care for the principle exemplified by the Manufacturers' and Producers' Association, and are only actuated by a desire to amass wealth regardless of any one but themselves, it becomes the business duty of the Manufacturers' and Producers' Association to take such immediate action as to give those people a choice between setting the price of coal at a living figure, a fair rate, governed by the law of supply, demand, quality and quantity, or standing competition. If the last alternative becomes necessary, there is certainly brains and energy enough in the association to mine, ship and distribute the coal itself. The fact that the trust has graciously exempted "steam coal" from the sphere of its exactions cuts only an indirect figure. The principle is the same, and the concession is but a covert menace. Those people have gone too far and should be taught a lesson. There is no organization better fitted to do this than the Manufacturers' and Producers' Association, and the opportunity exists.

DIRECTOR OF THE MINT PRESTON last Wednesday issued an estimate of the production of gold by the mines of the United States approximately during the calendar year 1894, which he considers to have been 1,910,800 fine ounces, of the coinage value of $39,500,000, which is $2,500,000 less than the recent estimate of J. J. Valentine, of Wells-Fargo Express Company. The production of silver is estimated at 49,500,000 ounces, of the coinage value of $64,000,000. In the production of gold this State leads, with an output of $13,570,000; Colorado second, $9,491,000; Montana third, $3,651,000. Colorado leads in silver output, with, in Director Preston's estimate, 23,281,400 fine ounces, of the value of $30,101,200; Montana second, with 12,820,000 fine ounces; Utah next, with a production of 5,892,000, and Idaho, with 3,249,500. The revised figures place the world's gold yield for the year at $170,000,000.

A NEW YORK MINING MAN who is making his first visit to California expresses his surprise to the writer that San Francisco capitalists do not take more active interest in the development of California's gold mining industry. He says that nothing but personal inspection can convince any one of the enormous mineral wealth of this State, and that to California rightfully belongs the honor and profit of producing and acquiring it. San Francisco is doing a good deal in that direction, but is not at all hoggish, and is perfectly willing to see enterprising men from other States occupy and enjoy the good things with which Nature has endowed this favored commonwealth. There is enough for all.

Concentrates.

PLACER COUNTY has sent $1300 to the California State Miners' Association this year so far.

THE directors of the Jamison mine, Plumas Co., have about decided to build a mill on their property.

P. CLARK, manager of the Poorman mine at Burke, Idaho, says the mine will be worked out and shut down.

THE Hailey, Idaho, *Times* thinks that Camas No. 2 gold property will yield a net profit of $160,000 this year.

THE Phœnix mine, near Sierra City, is having its electric plant rejuvenated preparatory to beginning active work.

PATENTS to forty-three mining claims in different parts of Utah lie in the dusty archives of the Salt Lake land office.

THE $30,000 plant, including the mill of the Stewart mine, at Bingham, Utah, was totally destroyed by fire one night last week.

CHARLES WARD, a prominent mining man who was shot at Jerome, Arizona, by J. Brown last Saturday, died the following day.

THE Plumas *National-Bulletin* reports that forty men are employed at the Eureka mine and fifteen stamps are constantly crushing ore.

THE little quartz mill at the Black Jack mine, near Hornbrook, Cal., was burned last Wednesday. It will probably be replaced by a larger one.

ACCORDING to the Nevada *Transcript* $300,000,000 have been taken from the mines of Nevada county. For Sierra the Downieville *Messenger* claims $186,000,000.

JOSEPH HUGHES, representing Denver parties, is at Green River, Wyoming, fully equipped with pumps and machinery to thoroughly test the Green river placers.

THE Good Hope Mining and Milling Company has incorporated at Spokane, Wash.; capital stock $500,000; purpose, to operate the Good Hope mineral claim, Trail creek, B. C.

THE *Record* estimates that fully $150,000 is due from mines in the vicinity of Amador City to people there for wages and supplies. Probably one-half is due from the Gover mine.

WHILE working in his mining claim on Mill creek, Plumas Co., last Saturday, Moses Ewing was instantly killed by the falling of a tree which he and his partner had undermined.

THE *Record* says that the appointment of Harry A. Lee as Commissioner of Mines of Colorado has not thus far met with the approval of any one but the Governor and the appointee.

ABOUT two miles of the great Parrot ditch are completed at Gaylord, Montana. They have twenty-six miles in all to build, and a great part of it is to be done in heavy rock work and flumes.

THE Red Oak drift mine, near Saddle Back, northern Sierra county, is reported looking very promising, and present developments encourage the belief that it will soon be on a dividend-paying basis.

A NEW company has bought the Santiago mines, 150 miles from Durango, Mexico. They have put in a ten-stack smelter and are smelting ore yielding nine ounces of gold and an equal value of silver to the ton.

THE working force at the Bald Mountain Extension drift mine, Sierra Co., has been increased to fifty men. Nearly $60,000 has been expended in running 4000 feet of tunnel and opening out the pay lead.

THE Fremantle mine, Twenty-five Mile, Westralia, was sold in London within twenty hours of being placed under offer. Everything was done by cable, including the transmission of the purchase money.

THE nitro-glycerine house of the California Powder Works at Pinole blew up last Tuesday morning. Five white men and ten Chinese were torn to atoms and several others injured. The company's loss is about $15,000.

SACRAMENTO'S latest journalistic scare is occasioned by the filing of placer claims comprising three miles of the bed of the Sacramento river, near the Capital City, the supposition being that much fine gold is imbedded therein.

THE Australian Quartz Mining Company has incorporated at Sacramento; capital stock, $25,000. Directors—W. M. Woodward, Watsonville; E. E. Meek, Marysville; W. R. Benjamin, A. B. Ashley and J. A. Hoagland, Sacramento.

AT the Broken Hill Proprietary, Australia, for the week ending the 9th inst., 8079 tons of ore were treated, yielding 632 tons of lead containing 200,802 ozs. silver, also 1837 tons treated by amalgamating and leaching plants, producing 19,894 ozs. silver.

A COMPANY has been formed, says the Kingman *Miner*, to tunnel Stockton Hill, which, it adds, has produced more ore than all the other mines of Mojave county, Arizona. The tunnel will tap the ledges from 500 to 1000 feet below the present deepest workings.

C. G. FISK sends a photo of fifteen gold nuggets from his Ogdensburg and St. Lawrence mines, on Fall creek eleven miles from Washington, Nevada Co. The channel is seventy-five feet wide, and while the nuggets are not quite a yard wide they are extremely valuable.

THE Idaho City *World* says: "The Wells brothers made a clean-up yesterday from a run of 22½ tons of ore from their Summit mine, crushed in the South Africa mill. The ore turned out 76¼ ounces. The gold runs $14.20, which makes the clean-up $1084, or $48 per ton."

IN the State gold mines of the Ural, "artels" of "starateli," consisting of from five to ten miners, engage in mining and prospecting, and are paid by the Russian authorities in proportion to their find. "Artels" of this type sometimes find it necessary to hire outside labor.

THE Virginia, Nev., branch of the Nevada bank of this city closes its doors next Thursday by reason of dwindling business. In flush Comstock days the bank did an enormous business, the pay rolls being over half a million monthly, and the bullion handled averaging two and a half millions a month, the annual profit of the bank being nearly $1,000,000. Of later years it has shared the declining fortunes of the town, and after this month will have ceased to exist.

A YUMA, A. T., dispatch says: Eight gold mines at Picacho, on the Colorado river twenty-eight miles above there, have been sold to New York and Denver parties, who will put a mill on the property. Four of these are in the White Gold basin, and four are in the Picacho basin.

A GOOD DEAL more gold dust is being delivered at Grangeville, Idaho, this season than for several years past, the greatest portion coming from Salmon river. The water in the mountain camps has hardly started to running yet, but the yield will be fully up to the average.

THE case of mining expert Crossman, who was arrested at Carson, Nevada, on a charge of selling certain mining property he did not own, was dismissed when the defendant exhibited contracts with the mine owners showing that he was to have a half interest in case he struck gold.

GEORGE F. BECKER, of the U. S. Geological Survey, who has been investigating the gold-producing districts of the Appalachian region, reports that the entire South has produced about $45,000,000 worth of gold since 1799, $43,000,000 of which came from Georgia and the Carolinas.

JOHN BARRY, a shift boss in the Anaconda mine, Butte, Mont., was instantly killed last Sunday night by getting within reach of a blast. A few moments later James McGarvey, a miner, leaned over the shaft to call to some one below when the cage came down and struck him on the head, fatally injuring him.

ONE of the leading copper mines in the Lake Superior district reports that its yield in 1894 was 15,484,014 pounds, at a cost per pound of 5.68c. In 1864 the same mine produced 2,498,574 pounds, and the cost of mining was 26.71c a pound. The ore has changed but little in richness, and the wages of miners are a little higher.

JAMES BREEN, of Butte, Montana, for several years manager of the Parrott works, will build a smelter for treatment of the ores of Trail Creek, B. C. He has signed a contract with the others of the Le Roi mine for a supply of 37,500 tons of ore, with the option of taking an additional 37,500 tons at the same price when that contract is worked out.

E. A. ARADIE, formerly superintendent of the North Star mine, Grass Valley, sends a copy of the *South African Financial Record*, describing the Wemmer property at Johannesburg, of which he is consulting engineer. Improved management has increased the profits of the company from £2445 in September, 1894, to £13,482 in March, 1895.

NEXT to Silver Star the Nevada district attracting most present attention is Silver Peak, where a 30-stamp mill has recently been erected. There is no lumber for building, and several parties have returned to their respective camps to tear down buildings and move them in. Candelaria, Belmont, Montezuma and another place are on the list.

A SPOKANE, Wash., dispatch says: "News has reached here from Trail Creek, B. C., that a parallel vein of great richness had been discovered in the famous War Eagle mine. The Kansas City Smelting Company about a month ago offered $1,000,000 for the mine, but the majority of the stockholders wanted more. The property now is not for sale."

THOMAS CHAPMAN was found dead about 100 feet below his mining claim on Hopkins creek, near Gibsonville, Sierra Co., last week. It is not known definitely whether he was killed by a cave or blown up with a blast, as the reservoir runs constantly night and day, and had washed him down the creek below the claim. His body was terribly mangled.

THE United States voting precinct having the highest altitude is that of North Star, located near the celebrated North Star mine on King Solomon mountain, in San Juan county, Colorado. The stone at the office door of the usual voting place is 13,101 feet above the level of the sea. North Star, although almost inaccessible for from six to nine months each year on account of snows, generally polls from 75 to 80 votes.

THE Detroit Copper Company has stopped all work at Morenci, Arizona, both in the mines and at the reduction works. The stated cause is that with the existing price of copper, and the ores of the mines there being low grade, taken in connection with the cost of freights, it was impossible to run longer without loss. It is said that the shut-down is to try to force the Arizona and New Mexico railway to give cheap freight rates to the Detroit Company on coke and other supplies.

RECENT Colorado incorporations are: The Great Western Gold Mining Company, capital stock $300,000; headquarters at Colorado Springs; to operate in El Paso county. The Boston and Cripple Creek Mining Company, capitalized for $300,000; to operate in the Cripple Creek district. Gunnison Gold Mining and Milling Company, capital stock $100,000; to operate in Gunnison county. Electro-Magnetic Concentrating Company, capital stock $500,000; principal office at Denver.

DIRECTOR OF THE MINT PRESTON publishes his estimate of the total gold production of the United States for the year 1894 and makes the aggregate amount fall short of the production of 1893. Colorado shows considerable increase, California the greatest increase. Mr. Preston estimates the total gold production for the year at $39,500,000. Mr. Preston some time ago predicted that the production would exceed that of last year, but he now says that he was deceived by the miners throughout the country.

REFERRING to the coming collapse of the mining craze in South African gold properties, and the increased demand for American gold mines, the Boston *Transcript* says: "May it not be that what we are to see in the early future is an American gold mining speculation? Following the English leadership, is there not, for reasons similar to those operative abroad, a very promising field in the development of gold fields as inviting as that of South Africa to the foreign investor?"

THE Rocky Mountain Milling Company, Limited, capital $50,000, has incorporated, to acquire from the California Mining and Milling Company the lease of the Gregory mill site, 40 miles west of Denver, and to erect a customs concentration mill, the cost of which, it is estimated, will not exceed $25,000. It is estimated the profits will be $1,000 per month. The chairman of the company is Mr. John Peters, and, in addition to Mr. J. H. Collins, he has associated with him, as a director, Mr. C. H. Thompson.

THE total production of iron ore in this country in 1894 was 11,879,679 long tons of 2240 pounds, as compared with 11,587,629 long tons in 1893—an increase of about 2½%. Of the classes of iron ore mined the red hematite continues to be the leading variety, being 79% of the total production, brown hematite, magnetic and carbonite following in the order named, the last being only about three-fourths of one per cent of the total product. The number of blast furnaces in operation also shows an increase over 1893. The number in blast at the close of 1893 was 137; at the close of 1894, 185. In spite of the increase in production noted, the total value of the product was but $13,577,325, or $1.14 a ton, as compared with $19,265,973, or $1.66 a ton, in 1893.

ADVERTISEMENTS have lately appeared in the Butte, Montana, papers signed by the trustees and secretary of the Anaconda Mining Company, calling a meeting of the stockholders of that company at Butte for June 24th to consider the submission of a proposition to sell all the mines, mining ground, quartz mills, smelters, concentrators and reduction works belonging to the company and such other property as may be decided upon by the stockholders. The advertisements also state a reduction of the capital stock of the company to $1,000,000, or such other amount as the stockholders may decide upon, will be considered. Nobody there seems to know exactly what this means, but it is reported that the Anaconda people have an offer from a foreign syndicate for the purchase of their mines and plant, and that the June meeting is called to consider it.

NEGOTIATIONS are pending for the transfer of fifteen claims in the New York district, adjoining Vanderhilt, San Bernardino county. One-half these claims are owned by the Gladiator Mining Company and the other by R. F. and P. House. The property is situated on the line of the Nevada Southern road, at the present terminus. A shaft has been sunk 200 feet and a tunnel from 500 to 600 feet to a six-foot vein of gold and silver which assays well. The principal stockholders of the Gladiator Company are General Woodbury of Denver, I. A. Blake of New York, and D. Y. Scofield of this city. The Messrs. House own the other half of the property. The plan is to consolidate the properties. It is said the present owners have already bought ground and accepted plans for a smelter, to be erected at Needles, and that even if the sale does not go through they will proceed to develop the property on their own account.

LEADVILLE, Col., produces two classes of manganese-bearing ores—a manganiferous iron ore used to some extent in the production of spiegeleisen, and a manganiferous silver ore used as a flux in the smelting of silver-lead ores. The ores are all from the upper workings of the Leadville mines, and carry manganese in varying quantities, from 5 up to 25 per cent, and occasionally 30 to 35 per cent, with 0 to 20 ounces of silver, 0 to 4 per cent of lead, 7 to 8 per cent of silica, and 30 to 50 per cent of iron. As a rule, this class of ore carries but little silver, though some of the slags from the blast furnaces are so high in silver as to make it profitable to rework them for the recovery of the silver. No effort is made to save the manganese in the ore used in silver-lead smelting. In iron smelting the manganese enters into the composition of spiegeleisen. The ore is a manganic and ferric oxide, the iron being limonite, and the manganese probably psilomelane.

DURING the year 1894 the total number of persons employed in and about all the mines of the United Kingdom was 739,097, of whom 705,240 worked at the 3419 mines under the Coal Mines Act, and 33,857 at the 740 mines under the Metalliferous Mines Act. Compared with 1893, there is an increase of 22,232 persons at mines under the Coal Mines Act, and a decrease of 1882 persons at mines under the Metalliferous Mines Act. Of the 705,240 persons working at mines under the Coal Mines Act 569,678, or about 80 per cent, were employed below ground. Of the 135,562 surface workers 4583, or about three per cent, were females. At the mines under the Metalliferous Mines Act 20,011 persons, or about 60 per cent, worked below ground, and of the 13,846 surface workers 1092, or about eight per cent, were females. The total output of minerals at mines under the Coal Mines Act was 199,451,018 tons, of which 188,277,525 were coal, 2,164,863 fireclay, 6,814,546 ironstone, 1,986,385 oil-shale, and 207,699 sundry minerals. The amount of coal raised exceeds by 2,798,399 tons the highest output hitherto recorded, viz., that of 1891.

COL. MCLAUGHLIN, of Oroville, has wired to the English owners of the Golden Feather that they are on the eve of success. He cables: "Canal, head-dam, foot-dam, elevators, pipe line, ditch in perfect order. If all goes well, and weather favorable for operations, I hope to be able to turn the river in June." Alfred Berwick, the president of the company, says: "Last year the river was turned at the end of June, and I shall be very glad indeed if the Colonel is able to repeat the operation at the same date on this occasion, for this simple reason: that last year, when the river was turned, the whole of the difficult work of getting to the bed of the river, and fixing all the machinery in position, was still staring us in the face. The operation, under the most favorable circumstances, lasts for four months, and if it is done in that time, then we are very fortunate. Last year, as you will recollect, instead of attempting to make any efforts to recover the gold we authorized Col. McLaughlin to direct all efforts to making the machinery safe at the bottom of the river. That was done, and, in addition, preparations were also made towards clearing the river, so that directly he turns the river this year he can at once begin to sluice in pay gravels. We have been able to save the four most valuable months in the year, which should mean a very good story for the shareholders before the end of the season; for, in 1857, when the river was only turned for a short time by some energetic Californians, who managed to make a wooden flume, and to carry the whole of the water of the river for some six weeks, these hold men in that time recovered from a small section of the river, with the most inadequate appliances, an amount equal to a million dollars, and we know for certain that the sum of $700,000 was declared in dividends to the shareholders. They never had again such a successful year, or a year when the weather allowed them the opportunity to reach the gravels, and no further gold has been recovered, so that it remains for us, as soon as the river is turned, to at once commence operations, and then the Colonel will have at least four months for working in these gravels, which we know to contain the gold."

As Seen Through English Eyes.

"Recent Improvements in American Metallurgy" vas the subject of a discussion by Jas. Douglas before the London Society of Arts on the evening of the 22d ult., which is interesting to American mining men as illustrative of how our mining and metallurgical methods appear to an English mining engineer. His lecture is reported in the London *Mining Journal*.

After pointing out the distiuctiou between machinery and methods which are essential, or merely useful. in certain peculiarly conditioned localities, he vent on to say that there are two standards by which metallurgical, as well as other technical processes and practices, are to be judged—the staudard of absolute excellence and that of economical utility. The series of operations by which the minutest trace of each valuable constituent of an ore is recovered, and by which the reagents used are regenerated, represents, no doubt, the highest standard of the art of metallurgy; but, on the other hand, the process by which most money can be made out of a given ore in a given locality is awarded in practice the reward of adoption, even though it be wasteful or reprehensible from a scientific or technical point of view.

Remembering that most of the large mineral deposits of the United States are situated far from the center of population and of chemical industry, where, therefore, by-products are of little or no value, where fuel and reagents are dear, and where labor, owing to its scarcity and the great cost of living, commands higher wages than in any other section of the Union, it can readily be conceived that the simplest, even though it be not the most perfect, the speediest, and not the most thorough process, will be selected with a view to saving only the most important constituents of an ore, regardless of its subsidiary and less valuable elements. To the present day American metallurgy retains some of the traces of its early youth, especially a tendency to work ou a grand scale, and to subordinate scientific accuracy to a large output. Nevertheless there is exhibited in all the newest establishments uot only great ingenuity in arranging the machinery so as to obtain the maximum of automaticity, but a freedom from prejudice which prompts the candid examination and due estimation of novel inventions, coupled with a keen appreciation of the value of a scieutific training in the technical staff. The result is that work is done not ouly cheaply bnt well, and that even though American metallurgical establishments are not types of those completely equipped factories, where every constituent of the ore is saved, and the value of the by-products rises higher than that of the metal which is the primary object of search, they afford instructive examples of the judicious application of mechanics to metallurgy, and of the extent to which capacity serves as an auxiliary to economy.

In fact, the replacemeut of hand-labor by machinery is the most conspicuous difference between the metallurgical establishments of America and those, with a few exceptions, of the Old World. This peculiarity of American practice has been forced upon the profession by the high cost of labor as compared with the European standard in all the mining districts of the United States, and especially in those of the Rocky mountain region. For instauce, in Arizona daily wages are at present for miners 12s., for furnace feeders and tappers 12s. In Butte they are even higher, miners receiving 14s., furnace men 13s. On the Comstock 10s. is still paid to miners. Colorado from 10s. to 12s. is paid to miners, and corresponding prices to mill hands. Iu California, owing to the lower cost of living and the denser population, wages are lower than elsewhere in the west. Nevertheless, miners generally get 10s., and sometimes 12s. Such being the rate of wages in the principal centers of metal mining and metallurgy, it follows that from the initiation of the industry economy of labor has been a *sine qua non* of financial success.

With the steady decline of late years iu the price of products, with which a correspouding decline in the price of labor has nowhere taken place, the necessity of replacing manual by mechanical energy has grown more and more imperative. Therefore, not only in the ore concentration and in the gold mills, but in the furnace plants, the aim of the designer is to use to the uttermost the force of gravity, the power of water and the energy of steam and electricity in moving the material to be operated on, and to confine man's intervention as nearly as possible to the function of superintendence.

In reviewing the machinery, distinctly of American origin, Mr. Douglas described the original form of the Blake crusher, and of the large progeny of comminuting machines of which it is the parent. especially illustrating a circular form of crusher, such as the Comet and the Gates, to which for certain purposes, he would accord preference over the Blake. He also described in detail the steam stamp, which is not only used iu the concentrating works of Lake Superior, but likewise in some of the large western works, and in the East, where large quantities of iron ore have to be crushed for magnetic separation. Each stamp, as he desoribed it, is an isolated machine. The head is attached directly to the piston rod of a vertical steam cylinder, which is supported by four heavy converging pillars, resting on a solid frame, and holding in place a mortar. The steam valves are operated by eccentrics and rods which derive their motion from some terminal sources of power. While it will do a stupendous amount of work, it consumes from eight to nine tons of coal per diem, absorbs 150-horse power, and requires, in order to evolve its full efficiency, that it be supplied with no less than 7000 gallons of water per ton of ore crushed. Its capacity, working on soft rock, will run up to nearly 300 tons per stamp head when crushing coarse for concentration, or 150 tons when crushing fine for amalgamation. The only mills Mr. Douglas considers as supplying the place of stamps are the Sturtevant for dry crushing and the Huntington for wet crushing. He says, however, that it is essential to success in using the Huntington that the ore be reduced to coarse particles—say, by rollers—before entering the mill. In the Belmont mill, Telluride, Colorado, he saw four six-foot Huntington mills, fed from four sets of coarse rolls, crushing fine for amalgamation eighty tons of rock daily. The mill was driven by a fifty-horse power motor, deriving a 3000-volt current from a power plant fourteen miles distant.

As branches of mechanical metallurgy, Mr. Douglas referred to the more recent practice in gold hydraulicking, and the construction and management of free-milling gold and silver mills. He drew attention to Hendy's hydraulic elevator, which is successfully used for elevating large quantities of gravel to the level of the sluice boxes, where a sufficient head and quantity of water could be obtained. He quoted Mr. Hendy as saying that one of his elevators at the North Bloomfield Company's mine to-day is elevating 2400 cubic yards of water and gravel a height of ninety feet, using a water jet under a pressure of 520 feet. The lecturer also described and gave an illustration of a steam shovel and amalgamator, which is being applied to the excavating, screening and amalgamating of gold gravels in districts where either water is scarce or the level of the country prevents recourse to the usual hydraulic methods. He considers that the shovel can be successfully used where the gravels are not too coarse or mixed with large boulders. In that case the strain upon the machinery renders the cost of repairs heavy and the working of the machine slow. Under favorable conditions, he thinks it is possible that the claims of the company might be verified—viz., that sixty cubic yards an hour could be worked at a cost of ten cents per cubic yard. He gave statistics showing the very low figure at which free-milling gold ores are now treated in well-constructed mills. In such mills, when the power is supplied by water, and the stream of water is divided to Pelton wheels, coupled directly to the separate groups or even pieces of machinery, the absence of intermediate running gear increases not ouly the sense but the reality of automaticity, aud makes the skillfully arranged and thoroughly equipped California gold mill one of the triumphs of modern mechanical metallurgy. As an instance of the subdivision of water to separate parts of the machinery, he gives that of the North Star mine, in Nevada county, California, where, at the hoisting works, under a 237-foot head, an eight-foot Pelton wheel works the pump, and a six-foot Dodd wheel works the hoist. The Dodd wheel is fitted with treble-nozzle distributors, which arrangement permits of the shutting-off of the water as the car ascends the incline. At the mill, under a 227-foot head, a six-foot Pelton runs forty stamps with ninety miners' inches of water; a three-foot Pelton runs sixteen vanners with eight miners' inches; a four-foot Pelton runs the rock-breaker with twenty miners' inches; and a three-foot Pelton, supplied with water which has already been used at the hoisting works, runs a dynamo for lighting and other purposes.

Referring to free silver milling, Mr. Douglas pointed out the lack of thorough scientific investigation of the reactions involved in the Washoe process, and this he was inclined to attribute to the fact that mining and milling have been disassociated on the Comstock lode, and the milling has been controlled and practiced by companies whose aim is certainly not to give publicity to their operations. He compared the results, so far as known, of silver extraction in the Washoe mill and in the patio establishments in Mexico, showing that, so far as excellence and thoroughness go, Mexican work excels the American milling work, but that the extreme slowness of the patio process is an insuperable objection to its adoption.

The lecturer concluded by saying that the above examples are a confirmation of the thesis that speed and perfection in metallurgy do not always go haud in hand. but that it is none the less true that ouly by the aid of machinery and the handling of quantity with celerity can the demands of modern trade be supplied and lean ores be treated. The aim, therefore, of the modern metallurgist must be to attain speed without sacrificing accuracy, and to that goal we are fast approaching.

A lecture was given on the 29th ult., which was devoted to a description of the many forms of mechanical calciners in use in the United States, and to the chlorination of gold aud silver ores.

The Haycraft Process of Gold Extraction.

A public test of Haycraft's patent gold-extracting process recently took place about two miles from Adelaide, Australia, where the plant has been erected. The crusher was desigued to pulverize auriferous veinstone without the use of water, which is considered objectionable in Haycraft's process, as being likely to wash away at least an appreciable portion of the very fine gold, and to produce slimes, which are also better done without. The crusher has hardly come up to the expectations that were formed of it, says the *Mining Standard*, but another plan is likely to be adopted. The veinstone or ore after passing through the crusher and being reduced to a very fine grade is conveyed to the upper floor, just above the level of an iron pan or cauldron, into which it is placed and where the actual gold extraction takes place. In the present plant the capacity of this pan is sufficient to contain a ton of pulverized ore. Possibly in future plants its dimensions might be increased, where larger quantities of auriferous material have to be treated. The arrangements for working ou a really extensive scale would require larger paus or several of them; in either case, however, the cost would not be very great. The pau is fixed over a furnace, as the contents have to be kept boiling for an hour while the material is being treated. Water is here mixed with the crushed stuff, making it about the consistency of thick pea soup. A vertical shaft having revolving arms attached to keep the contents of the pan constantly stirred, works in the cauldron. The arms are fitted with carbou shoes, which forms the anode through which the electric current passes through the saline liquor to the bottom of the pan, which with a dish of quicksilver in the middle forms the cathode. At another part of the upper floor a dynamo is fixed to supply a powerful current of electricity to the contents of the pan and the stirrers. At the trial the index showed it to be working with an output of over 100 amperes at an E.M.F. of five volts. A small perceutage of common salt or other chloride is added to the water; the salt being decomposed by the electric current, the sodium passes to the mercury, and the chlorine rising through the mass of pulp dissolves the fine gold it meets with, and forms a chloride of gold. As the pulp circulates in the pau this chlorine comes under the operation of the electric current and is decomposed in turn, the chlorine being liberated to seek more gold, while the gold passes to the mercury cathode, thus producing ordinary amalgam. In the meantime any coarser particles of gold that are too large to be dissolved by the chlorine gravitate to the bottom, and are also taken hold of by the mercury. After the contents of the pan had been kept for an hour at the boiling point and stirred by the revolving arms, subjected also to the electric current, they were drawn off into an iron trough, except the mercury amalgam. From this trough they were washed out into a shallow trough or "shaking table," having a horizontal longitudinal movement; its object is to recover any small quautity of mercury that may have got mixed with the pulp, and any pyrites that may be worth subsequent treatment. The water finally flows out into settling pans and can be used over again, thus economizing as much as possible what is an expensive element in countries like West Australia.

Immediately on clearing the pan of one charge, another can be put in and the process repeated until the entire parcel is finished, or it is deemed necessary to clean up. The mercury amalgam is then taken from the pan and retorted in the usual way. This small plant is capable of treating twelve tons per day. The cost of treatment, including crushing, when working continuously, is estimated at about 7s 6d per ton, and the royalty to be charged for the use of the patent is fixed at the low rate of 2s per ounce of the gold recovered. The first bulk trial resulted in saving 92% of the gold out of a total content of 2 oz. 4 dwt. 16 gr. per ton.

How To Organize a Pearl Factory.

An extraordinary treasure, illustrating the successful manner in which gems can sometimes be produced by the "strategical process," was lately shown by the Smithsonian Institution. This was a pearl, the size of a pigeon's egg, of exquisite rose color, and the receptacle containing it was the original fresh water mussel in which it had been formed. The nucleus of this wonderful stone was nothing more nor less than an oval lump of beeswax which had been placed and left for a few years between the valves of the mollusk, which had at once proceeded to coat it with the pink nacre it secreted for lining its shell. The mussel was kept iu an aquarium while engaged in its lengthy task. It belonged to a species common in American rivers, and it is suggested that the result of the experiment opens to everybody the possibility of establishiug a small pearl factory for himself, by keeping a tank full of mussels and humbugging them into making great "pink pearls" for him. But the intending experimentalist is cautioned against avarice; the nucleus must be introduced well under the mantle of the creature, and, above all it must not be too large.

Silver Mines of West Kootenay, B. C.

A paper with this caption, by E. D. Ingall, M. E., Chief of Mining Statistics, Ottawa, was recently read before the Sydney meeting of the Mining Society of Nova Scotia. The following are extracts therefrom:

Until a comparatively recent period the mineral production of the Province of British Columbia was almost entirely confined to coal and gold, the latter chiefly obtained by washing the shallow auriferous gravels distributed widely throughout the province. The discovery and working of veins yielding silver ores is of a later date.

According to Dr. Dawson, the largest deposit of galena, now known as the Blue Bell mine on the east shore of Kootenay lake, was discovered as early as 1825. And amongst the earlier discoveries of this class of ores is that in the Coast Range mountains at Hope on the Fraser river.

The galena varies in grain, from large cubes down to a fine steely fracture.

It is sometimes enriched by the presence of ruby silver and the richer silver minerals scattered through it. What is known as "carbonated" ore occurs with the galena, but this is not really carbonate of lead, as one might suppose, but is the ochreous gangue material in which the silver ore occurs disseminated in the native condition. The whole probably results from the decomposition of the gangue and of the silver-bearing galena of the vein. Other minerals are associated with the galena in places and in varying quantities. Of these zinc blende is the most prominent; iron pyrites occurring in fair quantity; other metallic ores being only occasionally present.

The pure galena in solid ribs seems to effect more particularly the narrower veins cutting the shales, whereas the big developments in calcareous strata contain generally a large proportion of zinc blende, which lessens their value.

Another class of veins show rich arsenical and antimonial silver ores in a gangue composed chiefly of quartz.

In one case a tunnel was seen on a new prospect where in its length of 75 feet it was estimated that the ground broken had yielded from 50 to 60 per cent pure galena assaying 125 ounces of silver to the ton. Or again another prospect pit was seen showing a two-foot rib of absolutely pure "steel galena" with ruby silver, the ore assaying 860 ounces of silver to the ton.

When one sees such exposures you cannot help feeling that the district has a very hopeful future before it.

There is a singular law that prevails in relation to the yield of silver by galena.

All the world over the galena found in veins cutting through shales is richer in silver than the galena found in veins cutting through limestones, and it here appears that the schistose rocks are like the limestones—less argentiferous.

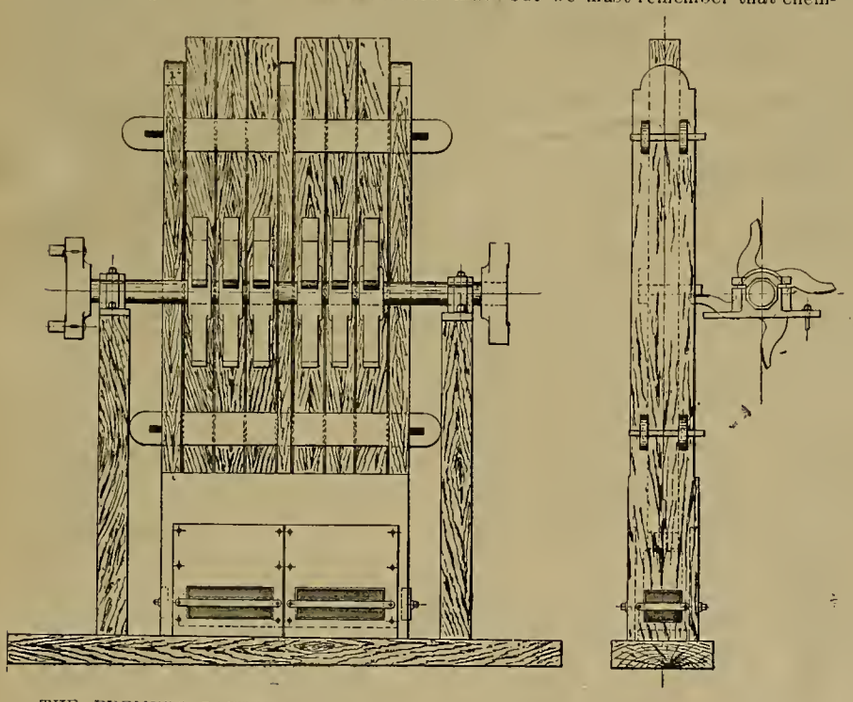
The galena from the veins in the schistose rocks seems to average lower in silver than that occurring in the shales.

GREAT DISTRESS prevails in Cornwall, says the *Mining Standard*, owing to the continued depression in the tin-mining industry, on account of the decreased American demand and the increased supplies from the Straits Settlements. The average price of tin during the present quarter has sunk lower than before. Most of the mines are working at a loss. It has been decided to close Betallack mine, which has been worked for centuries, and the fate of others is very doubtful.

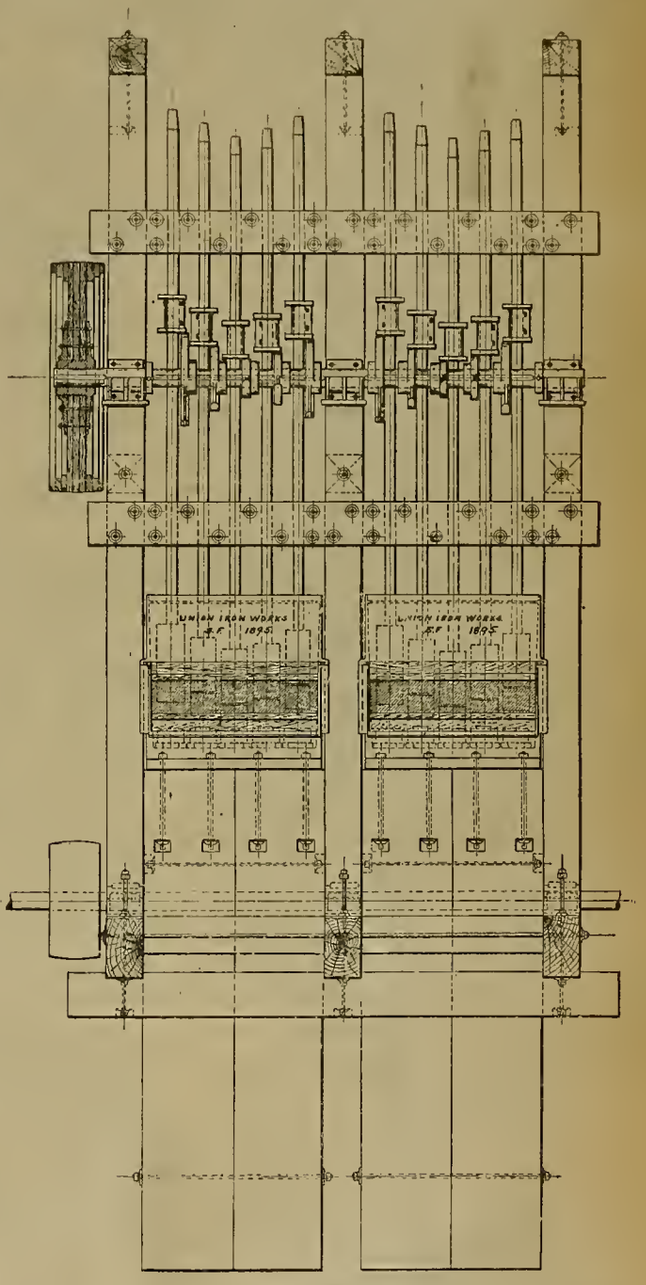
Evolution in Quartz Milling Machinery.

So much has been said and chronicled in these columns for the last thirty-five years of the progress and history of the gold stamp mill that it seems difficult now to add anything new to the complete record. Whenever a notice is given of the California stamp mill in any periodical, anywhere, the files of the MINING AND SCIENTIFIC PRESS are drawn on for data and illustration, and few factors in California's gold mining history have been more thoroughly noticed than the gold stamp mill.

As the pioneer mill of California has at this date a value by way of contrast, and showing what great strides have been made in crushing machinery, by the kindness of Mr. Melville Atwood and Mr. Almarin B. Paul we have been favored with the original drawing of the premium battery of 1858, an English mill shipped out from England for the Agua Frieo Co., and erected at Grass Valley, Nevada Co., in 1853, under the supervision of Mr. Atwood, general manager of the company, and "The Model Battery of 1895." As will be seen, there is a wide advance when we come to put this battery along side of the up-to-date battery. This paper being the permanent mining record of the coast, it will as well pass to the coming time, when the present perfected battery will be as far behind the times as it is now ahead of the pioneer mill, and the premium one of 1858. This may seem an ultra idea, but we must remember that chemistry and electricity are now playing an active part in the extraction of the precious metals, and what the coming years will bring forth only time can determine. The two cuts speak for themselves.



THE PREMIUM BATTERY OF 1858, FOR WHICH A GOLD CUP WAS GIVEN.



THE MODEL BATTERY OF 1895.

THE wire rope has been steadily making its way into new and varied forms of service since its entering the field as a competitor of its hempen predecessor. In many of these new uses it has demonstrated its special merits and superiority. The rigidity that in the earlier stages of its manufacture was a serious obstacle to its more general use, has been overcome by the progress made in the making of iron and steel, resulting in a flexibility making it easier to handle and more directly applicable where such a quality is necessary. The substitution of steel for iron has largely helped to bring about the desired results, which with new methods of grouping the wires has secured the necessary association of strength and flexibility. In the rigging equipment of ships and in hawsers used for towing purposes, the wire rope is to be found in the commercial and war marine of all nations. This in itself has developed an enormous industry that bids fair to keep itself in permanent activity, and to increase rather than diminish.

Curiosities of Corean Coins and Banking.

The funniest article of household furniture is the Corean cash box. Every man has his own bank of this kind. It is made of oak wood about two inches thick, and the lock to it weighs several pounds. The money is kept in this box, and is carried about on the backs of coolies or by servants when a man goes shopping, and in the winter it is put into the Corean safe deposits.

The Coreans have perhaps the best safe deposit system in the world, but it is one that works only during the winter. All their money is in Corean cash, which is made in coins of copper and brass, about as big as an old-fashioned red cent, with a square hole in the center. It takes six hundred coins, or three thousand cash, to make an American dollar. About twenty dollars is a good load for a man and forty dollars would break down a bullock. During the summer the Corean capitalist lends out his money for 5% and upwards a month, very judiciously placing it. In the winter, however, there is liable to be cold and famine, and it might be stolen, or his debtor might not be able to pay, so, as the cold weather approaches, he draws in his cash and puts it into his safe deposit vault until spring.

Every Corean has his own vault. It is usually his front yard, which is walled off from the street. He has his servant dig this up to a depth of about eight feet, and then the first cold frosty night he spreads out a layer of this cash in a hole and covers it with a coating of earth. He has water thrown upon this, so that the cash is imbedded in the mud, and it is watched until Jack Frost freezes it tight. The next night there is another layer of cash and a second coating of mud. This is frozen, and so it goes on until there is a solid frozen mass of cash and mud, lying two or three feet below the surface of the ground. On the top of this the ground is also frozen, and the the merchant can sleep without fear until spring.

Effectually Answered.

To the Editor :—As a sample of the injustice and mendacity of the anti-debris press, or rather of the rabid section thereof, I ask the use of your columns to call the attentiou of the miners of this State, and all other fair-minded citizens, to an item that originally appeared in the Marysville *Democrat*, and which would have passed unnoticed by me had it not been drawn from its obscurity by mention in other newspapers :

The *Democrat* is informed that large quantities of debris taken from the Banner mine is placed in the Feather river, which debris should he cared for in other ways. And the drainage of the works, which includes acids used in saviug gold, is permitted to discharge directly into the stream. The Banuer is a quartz mine located about three miles north of Oroville, and only a few yards from Feather river. Complaint is made by men who say the deposit of this matter is destroying the fishing in that vicinity.

Now, as a matter of fact, the Banner mine and mill, instead of being "only a few yards from Feather river," are located seven-eighths of a mile in an air line from the river, and such a liue would have to be projected across several intervening ridges. The mill tails into French ravine, which in turn empties into Oregon gulch, and, following the meanderings of these outlets, the nearest bank of the Feather river is one and a half miles south of the Banner mine.

I assert that not one ton of mill detritus reaches the Feather river in twenty-four hours, the gulches forming a series of natural reservoirs, and our slimes, for sampling purposes, beiug held back by a restraining dam. In milling and concentrating we use six inches of water, or rather that is the amount which leaves the mill, and of this I doubt if two inches reaches the river. Such of it, in fact, as does not seep into the ground on its journey to the river was used for many years by the former owner of the minc to irrigate a garden situated about half a mile below the mill, and his example is followed by the present occupaut.

As to "acids used iu saving gold," the charge is so ridiculous as to need no answer. As a matter of fact, I do not believe that any complaint has been made as to the killing of fish in this vicinity, or, if such assertion is made, it is for the purpose of blackmail, and is founded on arrant falsehood. The monthly product of the Banner mine adds more to the material welfare of the State than all the fishing operations on the entire Feather river, and my monthly disbursements for labor, supplies, etc., in connection with the mine is of more benefit to the community than all the fish that ever have been or will be caught in Butte county. Strange that "acids" powerful euough to kill fish when added to a volume of water equal to a flow of 2500 cubic feet per second, will, unadulterated as it comes from the mill, nourish flower gardens, strawberry and potato patches, and orange, peach, pear and fig trees as does the mill water of the Banner mine to-day.

If the Marysville *Democrat* can prove that the detritus from the Banner mine is, or has been, the cause of an increased mortality among the fish in the Feather river, or if it can prove any one of its charges against the Banner mine to be true, or founded on the slightest scintilla of justice, I will cheerfully donate $1000 to the funds of the Anti-Debris Association. Very truly yours,

FRANK McLAUGHLIN.

Oroville, Cal., May 20, 1895.

Personal.

W. C. Ralston has returned from a trip through El Dorado Co.

Col. Acg. J. Bowie is back from an extended sojourn in Utah.

Mr. Foster, of Spokane, succeeds Col. Peyton as manager of the Le Roi Mining Co., Trail Creek, B. C.

Ex-Gov. Blaisdell, who has fully recovered from his recent illness, is visiting mining property in Trinity Co.

Major W. H. Heuer, of the U. S. Debris Commission, has returned from an inspection trip through Nevada Co.

P. Geo. Gow. the local agent of the MacArthur-Forrest cyanide process, is in Sonora, Tuolumne Co.

R. Leo Van der Nailen has heeu appointed manager for the Boudreaux Dyuamo Brush Co., with headquarters at Chicago.

A. N. Butts, who sold the Golden Gate group at Mercur, Idaho, to Capt. De Lamar, is looking up some California mining property this week.

Luther Wagoner has taken charge of the McCall gravel mine at Grey Eagle Bar, El Dorado Co., recently acquired hy the Channel Bend Mining Co.

Mr. M. Bamberger, superintendent of the Golden Reward Cblorination Mill Company at Deadwood, S. D., says that he has decided to recommend the cyanide process to his company for the reduction of one class of ores, and the Russell process for those ores that carry silver with the gold.

Professor George F. Becker, Professor William H. Dall and Geologist Purrington of the United States Geological Survey left Tacoma, Wash., last Thursday to investigate under Government auspices the gold fields in the neighborhood of Shumagin and Kodiak islands, the district about Sitka and the coal fields about Cook's inlet, Alaska.

A telegram from New York to Australia has to go nearly 20,000 miles, 15,000 of which are by submarine cable, and it is handled by fifteen operators.

The Antwerp Exposition has closed its accounts and returned a twenty per cent profit to the stockholders.

Coast Industrial Notes.

—The Krogh Manufacturing Co. are shipping centrifugal pumps to Mexico and the Sandwich Islands.

—There were 28,232,178 feet of pine, spruce and fir lumber landed here from Washington and Oregon during April.

—The Sierra Valley Railway Company has put on a large force of men and is rapidly pushing the road to Beckwith.

—W. J. Houston, of Hartford, Conn., has leased ground for the erection of a large woodenware factory in South San Francisco.

—The Golden State and Miners' Iron Works is putting a 100 H. P. Harding gasoline engine in the new schooner Monterey.

—There is a scheme on foot in British Columbia to build more paper and wood-pulp mills to supply the Australian market, which must always import its paper.

—F. M. and E. A. Greenwood, of this city, with A. B. Ford, C. E. Knapp and P. M. Roedel, of San Mateo, have incorporated the San Mateo Electric Light Co.; capital stock, $25,000.

—South American houses are developing a new scheme for the organization of an intercontinental express company, hy which it will he possihle to export merchandise to Central and South America.

—A cut of from five to fifteen per cent in the wages of N. P. R. R. employes is considered in Washington and Montana—good evidence that J. J. Hill, of the Great Northern, has control in N. P. R. R. affairs.

—The S. F. and S. J. V. R. R. directors last Tuesday ordered three 65-ton freight engines to cost $10,000 each and 800,000 tie-plates. The preliminary surveys hetween here and Stockton are nearly completed.

—The Consolidated Electric Railway and Light Company of Vancouver, B. C., proposes to erect a water-power plant on Seymour creek and operate the Vancouver City electric railways and the lighting of the two cities by that means.

—The Paraffine Paint Co., 116 Battery street, this city, and 221 S. Broadway, Los Angeles, are supplying New Mexico and Alaska with their P. and B. paint, roofing and sheathing paper, illustrating their evident value in the demand from regions of such wide difference in humidity of climate.

—The Electrical Engineering Company, 34 Main St., this week installed a 25 H. P. dynamo to run the elevator in the Golden Gate building, and are completing a 50 H. P. dynamo for the Government in connection with the new guns at Fort Point. They have also this week installed a 12 H. P. motor in the San Francisco stove works.

—Information has heen received from the Treasury Department in relation to the proposed construction of a revenue cutter for service on the Pacific coast. The plans are not fully completed, but the vessel is to he huilt on this coast and will cost ahout $250,000. She will he the largest and finest equipped cutter in the Government service. Carrying ninety men and armed with two or three modern repeating cannon, she will greatly resemhle a small-sized naval cruiser.

—The Union Pacific R'y is said to have completed preliminary arrangements to reach this city: the idea is to build from Portland, Or., down the coast to Covelo. The San Francisco and North Pacific R'y is to he extended from Ukiah to that point, and a junction made with the Union Pacific, the bay terminal to he at Tihuron. The proposition involves considerahle expense and engineering problems of more than ordinary magnitude. The company's officers disclaim any knowledge of the matter and say the ahove is all news to them.

—The heavy purchases made in Washington hy the largest car huilders in the United States, the Tacoma *Lumberman* considers a most significant pointer. Wells, French & Co. of Chicago were induced to huild one car from Washington lumher. They did so, and, after its completion, put it on the scales. It weighed 2000 pounds less than one made of yellow pine, oak and white pine. Apparently that settled the question, for large orders were immediately nlaced for stock with dealers in Washington. So urgent were these demands that a representative of the company came on to push forward the orders. This compauy is now completing 600 refrigerator cars for the Armour Company to he used in the California fruit trade. This contract is to be completed hy July 1st, and it is for these cars that our lumbermen are forwarding stock.

—With the disappearance of the old Golden City Chemical Works there has grown up instead in this city the Stauffer Chemical Co., devoted to the manufacture of acids and heavy chemicals. Their sulphuric-acid chambers are immense, containing 159,000 cuhic feet, and are huilt to meet all the requirements of the coast. Their capacity for the other acids is equally extensive. Only from such large works can acids he produced cheap enough to warrant manufacturers depending on them. The consumption of sulphuric acid, that fundamental acid from which all others start, is as good an index of the industrial condition of a country as is the consumption of iron: therefore, whatever cheapens this article, promotes manufactures. The old rates on 66 acid, which were once so high as to interfere with and check manufacturing, are now reduced to 90 cents per 100 pounds, and a still further reduction is promised on large lots. In less than two years—their time in the field—the new company has secured the hulk of the trade, supplying miners and smelters as well throughout the West. Many carloads leave the works daily, reaching the Sandwich Islands, the Orient, Alaska and British Columhia. Industries hitherto unknown to California are springing up and are flourishing under the favors of this new company. The acid works of the Stauffer Chemical Co. occupy a block of land at the foot of Ninth street, in the southern part of the city, and their works for soda, whiting, sulphur, etc., occupy a block at North Beach, corner of Bay and Dupont streets. Offices at 402 Front street.

—Consul General Geringan at Shanghai, China, has sent to the State Department a comprehensive report of trade relations with China. After prefacing the statement with a report ahout the civil government of China, the principal commercial city of the empire, the consul general argues in favorahle terms of an international standard of value. He says China is a large market for cotton goods, hut there has been a falling off from 65,859,000 yards in 1892 to 27,706,000 in 1893. There has heen a falling off in the case of Great Britain from 497,475,000 yards in 1892 to 365,405,000 in 1893. The loss as regards the United States is so great, he says, as to excite anxiety. In 1873 the mills of the Orient and Occident were competing on relatively equal terms and receiving good returns. Now, in 1894, each mill employs the same amount of lahor as it did in 1873, hut the owner of the mill in the United States pays for the labor in gold at the old rates, while the owner of the mill in Japan pays for lahor in silver at the old rate. Not only does this principle of the difference in the value of currency in which lahor is paid iu the Eastern and Western countries apply to wages, hut it applies to whatever is essential to the success of agriculture and manufacturing enterprise. "If the land acquired twenty-five years ago hy the foreigners in Shanghai was worth $25,000,000 and was now sold for what it originally cost in silver and the proceeds converted into gold the loss would he ahout $12,000,000, and hy this rule it appears the inequality in the value of silver and gold has reduced the gold value of the world's property one-half. I am not writing in favor of a gold or a silver standard, hut in favor of an equalizing adjustment hetween the two. Silver is used by one-half the world and gold by the other half, and while wages in one half are paid in a depreciated currency and in the other half by an appreciated currency, a rivalry hetween the respective products of the lahor of each is encouraged, with the advantage from the outset to the products of the lahorer paid in depreciated currency, and especially when the latter can supply his daily wants with such a currency and which he willingly receives and remains contented with. Notwithstanding the plague and the war and consequent obstructions at the ports, the total value of the foreign commerce of China in 1894 was greater than ever hefore. It amounted to 390,307,433 taels, as against 367,995,130 taels in 1893. The customs receipts were greater than in any other year except 1891."

Books Received.

The chief publication received this week is "*The Mechanical Engineers' Pocket Book:* a reference book of rules, tables, data and formulæ, for the use of engineers, mechanics and students, by Wm. Kent, A. M., M. E."

Though the author modestly disclaims all assumption of originality, and anuounces himself solely as a compiler of facts and figures, yet a higher meed of praise is due him for his admirahle work than that ordiuarily accorded the mere compiler, for the contents of the work evince so much labor, condensation, exact judgment and commou-sense method as to make it of universal value to any practical man in any department of mining, metallurgy, mechauics, or applied science. The 1000 finely printed pages furnish an immense amount of practical information so arranged as to he available and of the nature most likely to he required. Every device that creates or transmits power receives elahorate attention, the tables are unusually full, and for the first time in a work of this character (so far as the writer's ohservation goes) "Electrical Transmission" is given a prominence commensurate with its importance. It is a hook indispensahle to mechanical engineers, and kindred workers, and while in no sense any competition with Haswell or Trautwine is suggested, yet the most cursory examination of the work evinces its superiority in at least the "up-to-date" information with which it is replete.

The hook is a 12mo., handsomely bound in morocco, gilt edges, etc., and is published hy John Wiley & Sons, 53 E 10th St., New York City, to whom all orders should be addressed. The price of the book is $5, postpaid.

"*What Is Heat? A Peep Into Nature's Most Hidden Secrets.*" Frederick Hovenden, F. L. S., F. G. S., etc., London, Eng.

It is helieved that the most tremendous sentence ever written is that which opens the Book of Genesis: "In the beginuing God created the heavens and the earth." Here is included the idea of the Creator—distance, space, weight, motion, time. From the date of the writiug of that sentence, 1500 B. C., to the present, we poor ephemeral humans have heen discussing the six things referred to—their relations to each other and to us. The matters akin to those things—heat, light, electricity, gravity, etc.—which we have named, and let go at that, have received equal attention. Now and then an original thinker has issued new concepts which have attained circulatiou commensurate with the truth they contained, and as the centuries slip like grains of sand through the great hour-glass of Time, theory, hypothesis and definition innumerahle have been evolved.

The book received, with the title as above, is a singular one and will attract attentiou. It is irreverent to the physicist, unsatisfactory to the philosopher, unjust to the mathematician and puzzling to the chemist; it disturhs the hiologist, contradicts some of the leaders of modern thought, upsets several pet theories of pet scientists and seeks to put molecular energy in new relations to what is usually termed "molecular physics."

Having asked "What Is Heat?" the author devotes 350 pages, handsomely printed and emhellished with 100 illustrations, to a discussion of mathematical and physical concepts: "What is a numher?" an object, an atom, a molecule, internal energy, the kinctic theory, gravitation, centrifugal force, matter, ether, electricity, vihrations, vortices, vacuums, convection, spheroids, and kindred topics iu a way that while one caunot wholly agree with him, yet his originality and manner of argument challenges the reason and often commauds the admiration of the reader. Some of his reasoning is too circular to be sustained; for instance, in decrying the accepted basis of all mathematical formulæ, he argues that as division is inverse multiplication, hence if $4 \times 0 = 0$, then $0 \div 0 = 4$. "This result," Mr. Hovenden says, "is quite in harmony with mathematical reasoning." Mr. H. will have some difficulty in securing acceptance of this allegation. His theory of gravitation is somewhat different from that of Newton, or Mr. Stephenson of this city (who hecomes irate if humhle criticism thereof he attempted), and while admitting that each individual atom has a specific power of attractiou, he holds that different species of atoms have different intensities of attraction.

All this is prefatory to the discussion and definition of "heat," which, like electricity, he holds to he a term expressing the reactions caused hy the absorption and flow of an incompressihle ether passing into and through the atom and molecule. This ether, he claims, can, under certain conditions, be seen. Part V of the hook is devoted to an elahorate explanation of how heat can be made visible to human sight.

He negatives the concept of the physicist that heat is the motions of the particles of which matter is huilt up, inveighing against that theory, and holds that "heat" is a form of molecular reaction, "an antigravitating fuuction of ether."

The work is a most interesting one and will elicit great interest among intelligent men who love inquiry and have no idols, scientific or otherwise. It is as uusettling to scientific belief as Darwin or Lyell to religious helief, and while we can not accept its utterances as conclusive, we can at least respect the earnest desire to solve nature's secrets that characterizes the purpose of the author.

It is published hy W. B. Whittingham & Co., 91 Grace Church St., London, England. Price $3.75, postpaid.

Receipt is acknowledged from the secretary of the Geograpical Society of the Pacific of an invitation to the Sixth International Geographical Congress, which will be held in London during the coming summer, under the auspices of the Royal Geographical Society. The list of honorary officers includes all the Ambassadors to the Court of Saint James, the Dukes of Westminster, Devonshire and Argyll, and numerous others of scientific or social prominence. America is represented by President Hubbard, of the National Geographical Society, Washington; President Davidson, of the Geographical Society of the Pacific, San Francisco; and President Daly, of the American Society, New York. The sum of £15,000 sterling has been subscribed in England as an entertainment fund, and the visiting delegates will be welcomed by a reception at the Lord Mayor's, followed by a round of balls, dinners, and excursions to points of interest. The delegate from the Pacific Society was appointed last year.

Mechanical Progress.

To Pump Coal.

Some time ago it was announced that a proposition had been made to convey coal by means of a pipe line, just as petroleum has long been moved. At first the idea was regarded as a joke of some enterprising journalist, but from time to time the project came to the surface. It has since been explained that the gentleman who originated the idea is Wallace C. Andrews, of the New York Steam Heating Company. He is now pushing for the construction of an experimental line, and the matter has been brought to the attention of Pittsburg coal operators and it is proposed to build a line from the Moon Run coal fields in the district to some manufacturing establishments just outside of the Pittsburg city limits. This line would be about four miles in length, and the originator claims that it will fully demonstrate the practicability of his idea. A detailed explanation of the working of the plan is thus given by the inventor:

"I believe that I have invented an exceedingly valuable method of transporting coal from the mouth of the coal mine to the general market or place of consumption. I first grind the coal to a fine powder, and by the well known process of 'washing coal' I remove an average of fifteen to twenty per cent of worthless matter. This consists of sulphurets of iron, rock and slate, which form the ash and clinker. Having thus purified the coal, I mix it one-half coal and one-half water, and pump it (precisely as crude oil is pumped) to market and deposit it in settling ponds or basins. These are cheaply made of earth embankment, with the ordinary plow and scraper. They will store 10,000 tons per acre.

"The cost of grinding will not exceed six cents per ton at or near the mouth of the mine. I also have proposals from Germany to establish here their latest machinery for washing coal, and guarantee it in plants of 500 tons per day at three cents per ton, and in plants of 1000 tons per day at two cents per ton. This makes, say, ten cents per ton for grinding and washing at or near the mouth of the mine. They also guarantee that the coal thus purified will have but about three per cent of ash and clinker, whereas coal as now shipped from the mines and delivered to the present method of railroad and water carriage gives from ten to fifteen per cent ash and clinker, and in many cases even more than this. The cost of grinding and purifying the coal is ten cents per ton, and the coal is worth at least fifty cents per ton more to the consumer.

"I have a report of tests made in Germany in the use of fine coal, showing an increase of twenty per cent of evaporation; I have also a report of tests made in Pittsburg showing twenty per cent increase as compared with lump coal. I think my estimate of the increased value of the coal to the consumer, thus ground and purified, taking the country at large, and especially at points where coal is expensive, is a fair one at fifty cents per ton. When the dry powder of bituminous coal is blown into the firebox the atoms explode and form the next best fuel to natural gas.

"The following table is made up from actual tests showing the coal-carrying capacity of pipes in tons per twenty-four hours; pumping stations thirty to forty miles apart, according to grade (supposed to average from New York to Chicago thirty miles apart), with 200 pounds pressure per square inch:

Size of pipe—	Capacity per 24 hours.
4-inch will deliver	320 tons of coal.
6 " "	800 " "
8 " "	1,824 " "
9 " "	3,168 " "
12 " "	5,120 " "
15 " "	10,240 " "
18 " "	13,750 " "
21 " "	17,920 " "
24 " "	28,160 " "

"Where the world has been mistaken is that it supposed that this mixture would clog up the pipes. I find there is no tendency whatever to do this.

"We have found that we can not only pump a mixture of fifty per cent coal and fifty per cent water, but as high as ninety per cent coal and ten per cent water. The delusion has been that people supposed the coal to be so very much heavier than the water. The fact is that when pulverized to a fine powder, measure for measure, the coal is the lightest, because of the air it contains. When sent through the pipe line, however, and delivered into tanks or settling ponds and becoming quiescent, it settles very readily; ninety per cent will settle the first hour, and the water is ready to be drawn off the next morning."

In conclusion the inventor expresses the conviction that coal can be carried by pipe line for one-tenth the cost of carriage by railroad, that delivery into the settling ponds will be only ten per cent per ton of the usual and average cost of unloading coal, and that the delivery out of the settling ponds to the consumer will be only ten per cent of the average cost by present methods.

Scientific Progress.

Preserving Telegraph Poles.

The perfecting of the creosoting of wood process has proved a godsend to telegraph companies. Telegraph poles intended for the tropics are invariably creosoted. The timber is run into cylinders, which are then hermetically sealed with immense iron heads. Steam is then admitted into the cylinder and surrounds the timber. The temperature is raised by passing superheated steam through coils within the cylinder until the timber is heated all through at a temperature just high enough not to injure the woody fibers. The vacuum pumps are put to work and all the sap and moisture in the cylinder is exhausted, heat being still maintained in the coils to prevent the vapor from condensing and remaining in the timber. After this the oil is admitted into the cylinders while they are under vacuum, and a heavy pressure is maintained until the requisite amount of oil, which is determined by gauges and thermometers, has been forced into the timber. The oil arrests decay for an indefinite period; but to have every part of the timber saturated is expensive and unnecessary. Provided that the timber is treated by the heat and vacuum process, if the crevices and pores are sealed up with the oil to a sufficient depth, the timber is as good as if the heart has been thoroughly permeated. The woodpecker is one of the worst enemies of the telegraph pole, but the creosoted wood is entirely safe from his attacks. A large consignment of these poles has just been sent to Tampico for a telegraph line over the high mountains in Mexico. They were so black with the "dead oil of coal tar" which had been forced through them that they resembled iron in both weight and color. In Mexico wood is so rapidly destroyed by tropical birds and insects that it has been found expedient to incorporate poison with the preservative solution so as to prevent the poles from being used for roosting purposes. The wires must be of copper, which lasts longer than any other metal, and withstands better the weight of birds and monkeys, which crowd them at night. Even these, according to the superintendent of one of the leading Mexican telegraph lines, are not the greatest pests that have to be dealt with.

Pulsations of the Earth's Crust.

According to Professor John Milne the crust of the earth is in a constant state of agitation, earth movements being experienced at all times and in all lands; but they are so slight from mouth to month and year to year that they generally escape detection. In all the countries of Europe and in many of those in Asia (most notably Corea and Japan) these tiltings are so great as to be noticed.

Germany seems to be the seat of greatest European crust agitation, Japan occupying a smaller position in Asia. Of the above two countries Prof. Milne says: "In both Germany and Japan a tidelike movement too great to be produced by lunar attractions has been observed, the ground being gently lifted every twenty-four hours, and sometimes twice, and in all cases buildings, trees, etc., stand slightly inclined, like cornstalks in a gentle, steady breeze." In short, the earth is constantly breathing, so to speak, the crust making each respiration by a gentle rising and falling, similar to that of the chest in air-breathing animals. It is believed that a certain per cent of this earth crust disturbance is due to conditions similar to those which bring about earthquakes. This is especially true as far as it regards Japan, where it has been traced to the continual opening and closing of the broken strata in the main range of the mountains.

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References:

Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
Edward M. Preston, President Citizens' Bank of Nevada City, California.

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Electrical Progress.

Government Telegraph Service.

Patrick B. Delaney, a veteran telegrapher, thinks that the government could do the work now covered by the postal service, vastly better by means of the telegraph. Of course radical changes will have to take place. Mr. Delaney shows that at present it costs the telegraph companies three cents to bring a message from a customer to the office and another three cents to deliver it. As this rate is based on an average of twenty words per minute with hand transmission, and sixty words per minute with the quadruplex working, it is easy to understand that the companies cannot telegraph for less than existing rates. But hand working and great numbers of cheap wires will soon be things of the past. Automatic systems and a few big copper wires reaching out to the principal cities will have a vastly increased capacity, and will before long be employed to carry quantities of correspondence which at present we do not dream of. Mr. Delaney says: "Why should the government insist on carrying our letters by train at thirty miles an hour instead of by telegraph? Why waste twenty-four hours in covering the distance between New York and Chicago? There are about 30,000 letters exchanged between New York and Chicago daily. Assuming that they average fifty words each, all could be telegraphed over two copper wires the size of a lead pencil, and with time to spare." It has been demonstrated that with the automatic chemical method, 1000 words per minute can be recorded perfectly between New York and Chicago over a one ohm per mile wire. Messages can be perforated at the rate of twenty-five words per minute and typewriters can print from the received tape at the same speed. On this basis, letters of fifty words could be perforated, transmitted, printed and delivered through the mails at a cost of about five cents. This is what Mr. Delaney says we are coming to, if the government will only take hold of the work. It will be curious and interesting to watch the bearing of the enormous development of telephony which is close at hand, and to see what part it will play in the cheapening of telegrams, whether the government acquires control of the telegraph service of the country or not.

Brain Surgery for Idiots.

An operation has been performed in New York by means of an electrical saw, which seems to indicate a distinct advance in brain surgery. It is well known that idiocy is often caused by the premature closing of certain soft bones in the heads of children, whereby the growth of the brain is obstructed. The usual treatment is to take a piece of the skull bone from the top of the head, and thus afford the cramped brain an opportunity to expand. Heretofore, the bone has been cut out with a punch somewhat resembling a conductor's punch, but this method was so jarring to the brain that the resultant shock nearly always killed the patient. The new method, which has been successfully practiced by Dr. S. B. Powell, in nineteen cases out of twenty, is to make the usual four trephine openings into the skull, and to insert a broad strip of silver gently into one of the openings and work it along between the brain and the skull until it protrudes from the next hole, thus forming a shield between the brain and the skull, which obviates all danger of accident from the slipping of the instrument by which the portion of the skull is to be excised. A minute circular saw, operated by electricity, is then brought into use. A cut is then made from one trephined hole to the other, and a second cut is made about one-eighth of an inch from the first. The intervening bone is removed, and the brain is exposed. Two more cuts are made between the other trephined holes, the bone removed, the silver strips withdrawn, the flap of scalp drawn back and stitched, and the requisite bandages applied. Ordinarily, the operation lasts about twenty-five minutes. The great success which has attended these operations is attributed by Dr. Powell almost entirely to the great delicacy of treatment rendered possible by the electric saw. He thinks the operation has come to stay. It is not claimed that it will change idiots into persons of much mental capacity, but beyond question they can be improved so much in mind and brain that they will not be burdens to their friends and relatives, as idiots but too often are. The electric saw used weighs less than an ounce, and it can be operated as delicately as a scalpel.

THE Mutual Electric Light Co., a recent local organization, is credited with being the cause of the cut in San Francisco rates and with further intent to make a bold bid for extensive business. Its office and power station is at 617 Howard street; the officers say they have several contracts for furnishing electrical light and power and have filed bonds for the building of four miles of street conduits. They install four new boilers this week and announce an intention to make price and efficiency the test for their successful claims to public favor.

CONSTRUCTION of the Marysville and Auburn electric railway has begun. It will run from Marysville to Auburn, fifty miles, and will carry freight and passengers. Power for the road will be furnished by the South Yuba Water Company; the power house will be located near the line of the road below Grass Valley, Nevada Co.

THE churches of San Francisco are adopting the electric system of lighting, several prominent ones being handsomely decorated with electroliers. The old Paulist Cathedral on California street, which was dedicated more than forty years ago, is now being supplied with incandescent lights throughout.

THE flower fetes throughout the State, which exhibited unusual splendor, will be eclipsed at Santa Cruz this week by the Venetian water carnival, wherein thousands of incandescent and arc lights will line the water.

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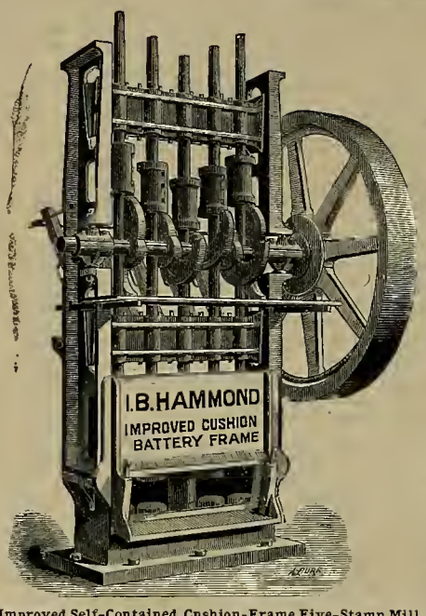

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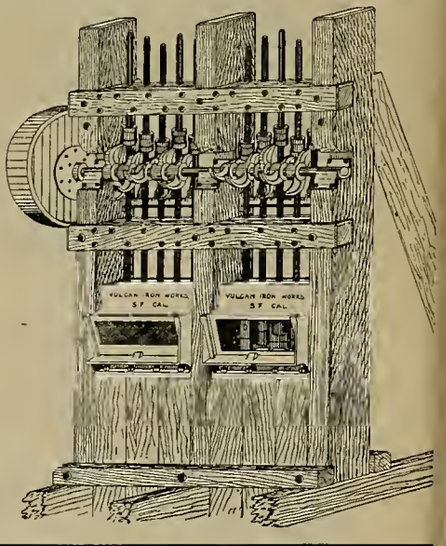

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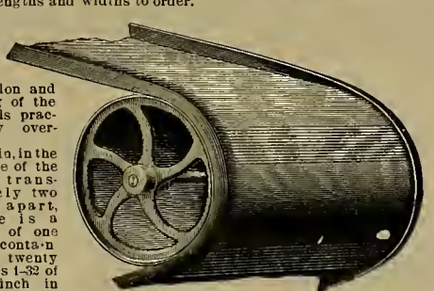

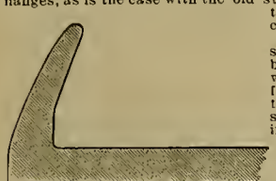

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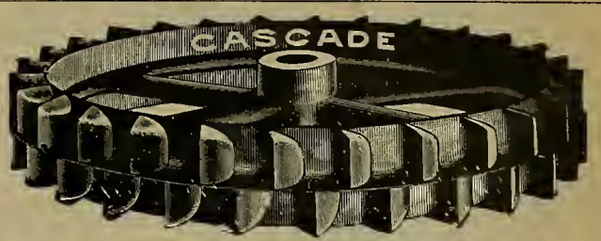

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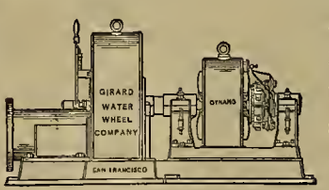

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SOUTH SPRING HILL.—Twenty stamps at the South Spring Hill mill in Amador City are running on ore from the Median mine. At the Median, the shaft is down 300 feet and drifting from this level has been progressing for some time, both north and south. The vein is strong and varies in width from five to fifteen feet and is of good mining quality.

BELLWETHER.—*Republican:* Mr. Underwood has the first option on this mine. Mr. Bright is in hopes that he will fail to come to time, as English capitalists stand ready to take it, paying $50,000 in cash, and $50 000 in stock, and will spend $200,000 in placing it on a working basis. Should the former take it he will personally superintend the operations.

MAYFLOWER.—The miners on the Mayflower and Original Amador properties have quit work on account of not receiving their pay. The wages have been running behind of late, and the men decided to quit until they received the whole or a considerable part of the sum due them.

THE ARGONAUT.—The Argonaut shaft is down 700 feet, still in slate, which is found harder to work than the adamantine greenstone previously passed through. The slate lies edgeways, and is full of seams, consequently it blasts badly. More holes have to be drilled, and the debris blown out is smaller it quantity. It was expected to tap the ledge at the present depth, but there are no indications at present of an early termination of the slate formation.

The Wildman and Mahoney mines, at Sutter Creek, both operating under the same management, have about 90 men on the payroll.

Butte.

GOLDEN QUEEN AND GOLDEN BUTTERFLY.—The Golden Queen quartz mill is reported ready to resume operations at Forbestown. The new tunnel for the Golden Butterfly mine, which has been commenced in the old Hendricks mine, is so low that a great mining district will be drained by it. If the drainage is as perfect as many experienced miners believe, the gravel and quartz mines about Oregon City and Cherokee will be greatly benefited, for they can be worked at a slight expense compared with the present expensive way of getting rid of the water.

GENERAL NOTES.—*Times:* Sixty-five men are employed on the Banner.

Work on the Golden Feather will begin early in July probably.

F. Parke and M. Hitchman of Hurleton will shortly open a placer claim on McCabe's creek.

The work on the Golden Butterfly is progressing. At present three shifts of four men each are employed, and the shaft is in about ninety feet.

The Golden Queen mill, at Forbestown, has been started up to make a mill test of about 300 tons of ore from the Honeycomb mine, which is owned by the same company as the Golden Queen. It is believed the rock will prove rich enough to warrant a continuance of the run.

The Clark Bros. & Duensing have put in a hydraulic pump on their gravel claim on the north fork above Big Bar. This pump is the first one they have found that would handle the water; and as the gravel is very rich, they expect to make a stake. In two day's run last fall they took out about $200, with seven men, but on account of too much water they could not then continue the work.

Calaveras.

THE BIRNEY MINE.—A strike is reported at the Birney mine, near Angels. While crosscutting on the 169-foot level a blind vein was encountered, and it is estimated that the rock will yield from $8 to $12 per ton. The ledge has been worked through eight feet, but neither the hanging-wall nor footwall has been discovered. It is locally reported that the mine was recently bonded for one month, and that since that time Salt Lake parties have offered $22,000 cash for the property. A representative of the Birney people is here to see the parties there who are negotiating for the mine.

El Dorado.

PARKER MINE.—*Republican:* R. S. Raw has taken charge of the Parker mine, between Grizzly Flat and Brownsville, as superintendent, and calls for bids to sink a shaft about one hundred feet deep on the property. Some New York men are interested with the present owners in the further development of the mine.

UNITY MINE.—Superintendent Kimble, at the Unity mine, has completed the changes in the machinery, which has been erected at the new incline, and the men will be put at work underground this week.

HAVILAH MINE.—The water was pumped out of the Havilah mine, at Nashville, several weeks ago, and the timbers found in remarkably good condition after their soaking of twelve years. The men are now engaged in stoping ore from the mine. The same company is operating the New London mine at Plymouth, and is having much trouble there, as the shaft was caved for 300 feet.

Kern.

AMALIE DISTRICT.—From our special correspondent: The Amalie mining district was organized April 13, 1895. It is situated in the Agua Caliente canyon, Kern county, about fourteen miles from Caliente on the S. P. R. R. Its laws outside of the U. S. laws are very simple. They require ten feet of work done prior to recording location notice, allowing sixty days in which to do the work. It also requires twenty-five days' work or an expenditure of $100 each year on every claim and an affidavit of said work or expenditure, to be filed with the district recorder.

Since the organization of the district there have been several good strikes made on which the required amount of work has been done and the notices recorded. There is probably no better field in California for the good, close, industrious prospector. There is plenty of wood and water, with as fine a formation for mineral as one could wish to see. There has been work enough done on some of the mines to establish, without a doubt, the fact of the existence of precious metals. The first of these is the Amalie, from which our district takes its name.

This mine was originally located by C. Moore, and in March, 1894, was bought by W. E. Rogers et al, and the Amalie Company was organized for its development. At the time of the purchase by this company there was but a few feet of work done, although this work showed a good lead of fair-milling rock with a streak averaging about two inches of shipping ore. In April of the same year there was a crew of men put on to develop the property. The ore was a chloride, carrying both silver and gold, about one-third of its value being in gold. They began sinking in two places on the lead. When at the depth of 100 feet they began a tunnel which connected the two shafts. Up to this time there had been no material change in the character of the ore, but the vein had gradually widened and the shipping ore had reached an average width of twelve inches. After connection was made, the tunnel was continued, following the lead for about fifty feet, when a round of holes brought a change of ledge matter, and for the next seventy feet they had an average of sixteen inches of as handsome, high-grade ruby silver ore as ever came out of the ground.

In about the center of this ruby shoot they started a winze which is now down 100 feet below the tunnel, making a total depth of 200 feet, and the ledge has grown stronger and richer with every foot in depth. On the 200-foot level the silver, in combination with the gold, is in the form of a chloride, sulphide and native wire. Every fifty feet drifts have been run from 100 to 200 feet each way from the winze and a second winze has been put down to the 150-foot level, which gives the mine a fine ventilation. So far no water has been encountered, and the company is putting in a gasoline hoist and making other necessary preparations to do some rapid sinking in the next few months. They have at present about twenty men employed and are shipping several cars per month to the smelters. They have a twenty-ton mill more than busy, and have now on the dumps about 300 tons of chloride and 400 tons of sulphide ore. This has ceased to be a prospect, and has as a mine a bright future before it. G. E. F.

Mariposa.

MACHINERY ARRIVED.—A carload of machinery arrived at Merced last week for the smelting works being erected near Hornitos by E. McGrath.

Nevada.

WASHINGTON DISTRICT.

Herald: King Bros. & Co. have obtained a lease of the Rainbow mine, in God's Country, and have commenced taking out ore.

Henry Phillips is pushing the work at the Mountain View mine and will have a mill up shortly. He will probably bring the mill in by way of Graniteville, and pack it by sections on mules from the old Star mine, which point can be reached by wagons.

Work continues as usual at the Oak Tree mine. A full force are at work and thirty stamps are kept constantly running.

The Rocky Bar mine is making better progress than heretofore, the place being better opened. Immense boulders are encountered, which necessitate a great deal of blasting.

Placer.

MOUNTAIN VIEW MINE.—*Herald:* McCullough's mill on Nortb ravine has been running the past week, crushing ore from the Mountain View mine down on the river south of Auburn. The rock pays well, averaging from $20 to $30 a ton. We understand Superindent McNaughten will erect a mill at the mine soon.

THE GRAY EAGLE MINE.—Breasting of high grade ore has begun at the Gray Eagle, and the mill has started up. In a recent report on this mine G. C. Hunter says:

"From the bottom up, for a distance of three feet, they have got splendid looking blue gravel, and I am of the opinion that this very blue gravel is the upper part of the pay ore and that it extends down and connects with the bedrock. How far the bedrock is below the level I cannot say. I find that they are in a great channel, once the bed of some ancient and mighty river. Taking as a criterion the richness of the other mines on the same divide, I do firmly believe that they have got one of the greatest and best mining properties of its kind in California. At a point several hundred feet back from breast a crosscut has been run to south rim. At this point the channel is about 125 feet wide. From the bottom of said crosscut a winze has been sunk to a depth of about six or seven feet, and no signs of bedrock in the bottom. The gravel for the whole depth would have paid, the superintendent told me, but the water was too strong and they had to quit. I have seen the rim rock on south side at several points along the tunnel, but the north rim I have only seen twice.

"It seems to me that the tunnel is near the center of the channel, as the layers or stratifications are nearly level across the breast. I very strongly recommend, and as strongly advise, that the tunnel be run ahead until they strike the bedrock, and when you have got that well in sight they can then open up the channel from rim to rim. The bedrock will then be the floor of your work, and breasting-out would next be in order. They are then prepared and in condition to work the mine intelligently, economically and to the very best advantage. There is no other way by which they can work the mine practically and in a common-sense way.

"There are many important reasons why this plan should be adopted. In the first place they can get the very best of the ore which will be found on and near the bedrock and up as high as it will pay, and by mixing all of it together you get a true general average. You will find in many places that the top of the bedrock is soft and full of cracks. There you will find the richest part of the ground and may extend from rim to rim for a depth of several inches, or until the rock gets hard underneath.

"This you mix with your gravel and all is sent to the mill together. You have got all there is of value and nothing has been either wasted or lost. Again, one blast would break more ground when you have a floor to break to, than two blasts would break when you have no floor to break to. This is a well-known and established fact everywhere in blasting ground. Again, you have got a solid foundation for your timbers to stand on, and again, when your bedrock has been thus exposed, you can take up all the water there is coming down the channel, and convey the same out through the tunnel, thus cutting off to a great extent and perhaps all of the water now flooding your incline. Were you to breast out your gravel now, or before you get the bedrock, the following results are bound to follow: In the first place you would be taking out your poorest ground and leaving the best behind you, or under your feet.

"It would cost more to take it out, because you would have no natural floor to work to. And the floor which you would have to work to would have to be made by hard work and giant powder thrown in besides. You would have no good footing for your timbers and your waste dirt would have to be shoveled into cars and brought out, or else throw it back on your richest ground, which you would be leaving behind you. And at some future time when you would work the ground, you would be leaving behind you, you would have to handle it all over again. The timbers you would have to use would have to be all taken out and thrown away as useless, as they would be too short to answer again, hence the timbers used and the time taken in cutting and putting them in place would be a dead loss to the company. The returns from the mill, I fear, would fail to come up to your calculations, and then a mighty growl would follow and everybody interested would be kicking, and a cry would go up that there was something wrong with the management—under the above conditions, maybe the very best—and the result, notwithstanding, would be sure to follow as described above."

Riverside.

THE GAVILAN MINE.—Work has been resumed on the old Gavilan mine, owned by a syndicate of English capitalists. Considerable bullion has been shipped from the Briggs mine, near Winchester, but only a small portion of the top of the ledge has been worked, and preparations are under way for carrying on the work on a larger scale.

A REPORTED STRIKE.—A strike is reported about a mile south of the Santa Rosa mine. At a depth of twelve feet the ledge discovered opened out to a width of six feet. One assay of the ore went to $130, and another as high as $400 per ton. As soon as the fact became known the country for a distance of 12,000 feet all around was taken up.

San Bernardino.

BIG COTTONWOOD DISTRICT. — Messrs. Sweeny and Muir have located a gold-bearing quartz mine in the Montenegro district, which they have named the "Leoti."

It is located on base line, about 120 miles east of San Bernardino, one mile northwest of the McKinley Bill mine, two miles southeast of Virginia Dale, thirty-five miles from Bagdad, on the Atlantic and Pacific Railroad, about fifty miles from the Southern Pacific, and about twenty miles from the celebrated McHaney mines, with plenty of water within five miles. It is a different ledge and rock from the latter, and is evidently a portion of the ledge of the Supply mine, located from one-fourth to half a mile from it, where they went down 110 feet in a seven-foot vein, that averages $65 per ton. The Leoni commences at the top of the mountain and runs down. So steep is the mountain at that point that the end of a tunnel run in 500 feet at the bottom of the claim would be 1000 feet from the surface above it.

THE ROSE MINE.—At the Rose mine, three miles from the Morengo King, beyond Bear valley, a large force of men is in a seven-foot vein, 400 feet down, in which there is a strip about twelve inches in width yielding from $300 to $500 a ton.

THE JOHNNIE MINE.—The new Huntington mill at Montgomery, in the Vanderbilt district, is completed and the old one repaired. Both are running on their full capacity on ore from Johnnie mine.

The *Times-Index* of San Bernardino claims that gold was discovered in that country long before the discovery of gold in the northern part of the State by Marshall. It says the precious metal was discovered in the San Bernardino range as early as 1841, and that the first shipment of gold to the East from California came from that range of mountains. The shipment amounted to over $1000, and the gold was remarkable for its purity. It also says that the location of valuable mines in that section was known to the priests long before Marshall's discovery in Northern California.

Mines in the Calico district are reported working to their full capacity, and the thirty-stamp mill is kept running day and night.

Some more borax deposits have been partially developed near Dagget.

THE DESERT QUEEN.—*Times-Index:* The Desert Queen, in the Pinon Mountain district, was discovered by the exposure by the operations of nature of a large plow-out on the brow of a hill. There the ore is denuded for about ten or fifteen feet in height and is traceable for several feet along the vein until it becomes a simple stringer at either end.

The surface croppings were rich and the property has been a producer since its discovery, sufficient ore having been milled at the two-stamp mill of Holland & Tingman to pay all expenses to date. Not much free gold appears in the ore, but it is rich, as the mill returns conclusively show.

But little development work has been done beyond the construction of roads, etc., for the hauling of the ore and bringing in supplies. The vein appears to be quite flat, as it can be traced on two sides of the hill. The development thus far bears this out, as the incline is now about four feet wide.

The mine was visited by F. H. Lane, of San Francisco, to see if it would justify the investment of $2,000,000. It is only a prospect as yet, and no agreement could be reached with the owners as to developing the property before purchasing.

Mr. Lane stated that after they had completed sufficient development work to demonstrate the value of the property he would make another visit and take the property if the showing justified it, and pay a good round figure for it.

In the meantime the owners will continue development work, and soon expect to have a five-stamp mill of their own at work.

San Diego

THE RICE CAMP.—Several new strikes are reported in the Rice gold camp, east of Warner's, San Diego county, and mining men are beginning to show an interest in the district.

Sierra.

STARTED UP.—The El Capitan or Rising Sun Company will start their new ten-stamp mill this week. The ledge is of good size and looks well.

Siskiyou.

MINING NOTES.—*Journal:*—Loveridge & Co., of the South Fork of Scott river, took out $800 in two days, and realize a steady yield of coarse gold.

Espey & Co. have the foundation ready at Shasta river for setting their 200-horse power pump in position, to raise water to their new flume for carrying water towards Hawkinsville from top of the hill over 500 feet above.

The miners in the dry gulches and small streams up in the mountains are busy washing pay gravel before the water gives out.

The latter part of last week Carrick & Bailey had a crushing at McCook's mill of eight tons of ore from their mine at Greenhorn, which yielded $800.

Songer & Dame, lessees of the McConnell & Quinne or Pacific river mine, on the island just below the mouth of Humbug creek, on the Klamath, are crowding the work with a large force. They are putting a current wheel in the river to operate the electric light plant, letting the steam engine furnish power for the derrick and China pump used in clearing the seepage water.

Trinity.

COMPANY FORMED.—*Journal:* The Trinity Consolidated Mining Company was incorporated last week in Red Bluff. W. H. Fowler, well known in this country, is superintendent. The company have leased a mine on Dog creek about six miles west from Delta and will work it. They intend putting up a ten-stamp mill.

Tuolumne.

GENERAL NOTES.—*Democrat:* F. and G. Pedro have taken it out big in the Simonich claim on Bald mountain. They took out $700 in one day.

Geo. Wainwright and partner have taken out a large pocket in the Stewart-Wainwright claim on Bald mountain. One piece of gold amounted to $300.

The Keltz mill of fifteen-stamps is in constant operation. Twenty-five men are employed in the mine and mill. The lode is well defined and is yielding handsome profits.

The S. S. Badger Company are making extensive preparations to work the Wilkinson placer claims, of which there are over 3000 linear feet along the river, and after subsidence of the river will employ eighty men.

Yuba.

LIVENING UP.—A company has been organized representing sufficient capital to thoroughly prospect certain claims and new discoveries in the vicinity of Brown's valley. J. C. Campbell of Brownsville, is the leader in this venture, and will have charge of the work. Work will soon be done on one or more old claims in the vicinity of Smartsville and Mooney Flat, and on a new development near Spenceville. The "R. C." quartz mine and mill, located at Brownsville, will be started up again as soon as arrangements are completed for some new machinery. The R. M. Johnson quartz mine and mill, located near Brownsville, has passed into the hands of new owners, or there has been new owners added who have the means to work the mine in a way to make it pay larger dividends. Two or three new discoveries in the vicinity of Brownsville and New York Flat will be worked this season, the prospects being such as to warrant placing machinery on them.

NEVADA.

Storey.

THE CROWN POINT TO START.—*Enterprise:* Empire, which has been under water for several days, is gaining some relief. The flood is abating, and what a few days ago promised to become a veritable Nevada Venice has proved to be nothing more than a succession of muddy wastes. The mills along the [illegible] been closed down on account [illegible] start up to-morrow, and [illegible] will put on its quota of [illegible]

y Mail, 10c.

THIS CUT ONE-HALF SIZE.

ARIZONA.

HASSAYAMPA DISTRICT.—The shaft [illegible] Zero mine in the Hassayampa district is [illegible] nearly one hundred feet and when that [illegible] is reached the owners will stope out ore.

pine has already produced about $50,000 worth of ore even at the low price of silver.

GOING DOWN.—The old cry of a class of so-called miners of this section, "that our mines do not go down," is being rapidly disproved by the new class of genuine miners who have taken hold here says the *Journal-Miner*. It is the miners and not the mines that did not go down. It is a fact however that the mines of this section have had a reputation abroad of pinching out at a very small depth. The Congress is down 1,300 feet, the Little Jessie over 600, the McCabe 300 and other mines from 300 to 700 feet and the experience of attaining depth, in all of the properties, where the owners have had the nerve and enterprise to sink, has been that the properties improved with depth. Two samples of ore, taken from the Little Jessie at a depth of 500 feet and the other from the McCabe at a depth of 300 feet, show that the ledge was good and strong from which it was taken. It is a sulphuret ore and went $340 per ton in gold. The sample from the McCabe mine, while being smaller in thickness, weighed about five pounds and was about two thirds free gold.

WANTS DAMAGES.—Geo. Gicker, of White Hills, has brought suit against the White Hills Mining Company for $10,000. One of the top workmen on the Grand Army mine pushed a mining car down the incline shaft that crushed Mr. Gickers leg so badly that it had to be amputated above the knee.

BRITISH COLUMBIA.

A BUSY SECTION.—Never were so many men drawing pay in Kootenai as now, says the Nelson *Tribune*. The payrolls are not all at any one place. At Rossland the payrolls of the mines and local enterprises will aggregate $1,000 a day: at Nelson and immediate vicinity, $400; at Pilot Bay, $150; at Ainsworth, $250; at Kaslo, the building of the Kaslo & Slocan railway will cause fully $1,500 a day to be disbursed for several months; in the Slocan, the pay rolls will aggregate $500 a day even now when little more is being done than dead work at any of the mines. It is safe to say that the disbursements for wages in southern Kootenai aggregate $120,000 a month. And what is better still, the mines of the country are producing every dollar that is being disbursed.

COLORADO.

THE FLORENCE REDUCTION WORKS.—The United States Economis Reduction Works, completed some time ago, but which have been undergoing a series of changes, are announced as a complete success in every particular. These works have just finished two independent runs to extract the gold from the ore which had previously been pulverized and roasted, and the trouble of successfully filtering this ore has been fully overcome. These works embody nine radically new features in ore treatment and the first of the kind ever erected, hence not only the construction of the machines, but the entire arrangement and relation to each other had to be fixed and decided upon without being able to refer to any other existing mill. In spite of this fact all of the changes which the company was compelled to make could have been made in a week's time had the material therefor been quickly available. The works which are now arranged for chlorination principally will now receive further apparatus so as to fit them for the treatment of ores by any wet process, which means the expenditure of considerable more money. The capacity of the entire plant will be doubled, being increased from 100 tons daily to 200 tons and no effort will be made to run the plant until the additions have been made, which will require about two months' time.

IDAHO.

IN THE COEUR D'ALENES.—The situation around Wardner is unchanged and will remain so until a definite reply is received from the officers of the Bunker Hill and Sullivan Mining Company. This answer, it is expected, will be brought by Manager Bradley himself, who last week was in Nevada county, this State, where he has a gold property of his own. He has not severed his connection with the Bunker Hill, and it is understood that when the mine starts he will be on hand to superintend the first turning of the wheels. The openly expressed opinion of Wardnerites is that when the mine is ready to start it will be given safe conduct through any possible turbulent times that may ensue.

OREGON.

JOSEPHINE COUNTY.—John C. Lewis, who has spent a large sum in developing his mines in Mount Reuben district, has struck a body of rich ore at a depth of 700 feet.

CLACKAMAS COUNTY.—Within the past week fifteen mining claims have been located in the neighborhood of the Red Rock lode, near the headwaters of the Clackamas river.

BAKER CO.

CROCKEN CREEK DISTRICT.—On the Eureka and Excelsior mine 30 stamps are in operation. The ore is base and difficult to treat. A 20-stamp mill is being operated on ores which are concentrated and the sulphurets shipped to the smelters. A 10-stamp mill is running on ores on which the cyanide process is being worked, this being the first instance of the successful working of the cyanide process in the treatment of Oregon ores. A great deal of money has been spent in experimenting with ores from the E. & E. mines, carload shipments have been sent to Denver, Eastern and even European cities [illegible] mented with in an endeavor to find method of treating the lower [illegible] too great loss. The [illegible] seems to have [illegible] lines are now [illegible] which is a southerly [illegible] and Excelsior, has [illegible] loped and operated successfully [illegible] years. The ores uncovered [illegible] known in both quantity and quality [illegible] one of the large and valuable [illegible] of the district. An extensive exploration and reduction plant will be erected this year. Shipments from the Columbia last year netted over $100 per ton. Considerable development work is being done on this and several other properties in the Cracker Creek district.

PLACER MINES AT GLENDALE.—William H. Taylor, manager and owner of the Victory placer mines at Glendale, in southern Oregon, states: "We have struck, and within a week will be working on true bedrock. The gold found therein, assays being made from twenty places along the new cut, just completed, gave us 940.8 fine, and weighing over fifty cents per cubic yard."

SOUTH DAKOTA.

THE HIGHEST ASSAY.—*Pioneer*: The new find in the Deadbroke tunnel on Blacktail breaks the record for high assaying. The tunnel is in something like 1,000 feet and a black slimy sort of stuff was encountered which slid through the batteries and over the plates. An assay of the stuff was made and it was found to be clay and plumbago carrying gold to the value of $71,000 per ton. It is not known how large the pocket is, or how soon it will be gone. The tunnel matter is cement and the clay and plumbago lie on bedrock in a small vein. There may be a ton or more of it and then there may be only a hundred pounds or so.

UTAH.

THE EUREKA-HILL.—Within the week the twenty additional stamps for the mill of the Eureka-Hill will be received at Eureka. With the addition of these twenty stamps the mill of the Eureka-Hill will be of sixty stamps capacity, one of the largest in the territory. No new pans are necessary, the plant now being equipped with pans and power sufficient to take care of eighty stamps.

A UINTAH SCHEME.—Some months ago the *Tribune* gave some attention to the Uintah Mining Company, and expressed the opinion that its promoters had accomplished a most remarkable achievement in financiering. Owning nothing but a lease and bond on a mortgaged interest in the Dolberg group of mines, they had incorporated a company, with a capital of $6,400,000, and actually succeeded in selling considerable stock in the East. The *Record* has made an investigation of the Uintah Company, with the following result:

The office, works and boarding-house were all visited, and not a soul was to be found anywhere, the whole works having been deserted. After diligent inquiry at the surrounding mines, and from men working in the immediate vicinity, it was learned that the two men who had been left in charge after work had practically been abandoned, had pulled up stakes Sunday last and moved out. In fact, while there has been a pretense of working the property all winter, very little has been accomplished, and no real showing has been made for the time put in. It looks very much as if a small force had been kept at the property more as a blind than with any evident intention of honestly developing the ground, and the men employed at adjacent works all say there appears to be something wrong about the company. Timbers and supplies have been secured on credit, and never paid for, while one of the men who formerly worked for the company says it owes more than $1000 for wages; that no ore was cut in the shaft, and that the company is no good.

WASHINGTON.

METALLINE DISTRICT.—Metalline remained dormant for ten years but now promises activity. Stages will run across the range to the once-isolated Metalline camp, on the Pend d'Oreille river. Preparations are also being made to open the river through Box canyon to admit of steamer transportation from Newport, on the Great Northern, down the river to Metalline, which will then be the foot of navigation on that river.

The ore in the camp is mostly galena and is heavily charged with silver. It has always been classed as a low-grade camp, in which the assays would show from 60 to 70 per cent lead and a dozen ounces of silver to the ton.

Placer work has been the chief pursuit in Metalline since it was first known, and trappers and prospectors have divided their time between hunting and mining. The deposits of gravel on the east side of the river are rich in gold, and much ground has been found which will average 50 cents in gold to the cubic yard. At the mouth of one of the creeks putting into the Pend d'Oreille just above the obstruction to navigation in the river, above Metalline, is a delta formed from the washings from the mountains that is pronounced the richest deposit in that country.

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Will confer a favor on the undersigned by writing the desired information to the address given below. Mr. Harris left Albany three or four years ago for Colorado, and a letter of inquiry to his brother elicited the information that his address was Trinity Centre, Trinity Co., Cal., but a letter addressed to him there was returned marked "uncalled for." E. J. LANNING, Albany, Oregon.

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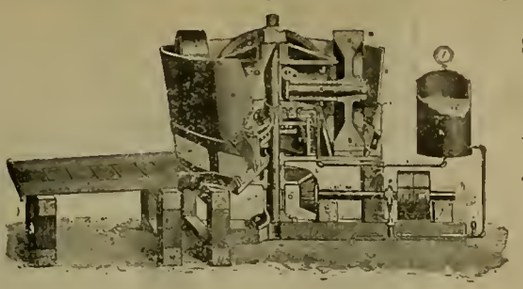

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The American Mining & Milling Machinery Co., Cleveland, O.:
GENTLEMEN:—We purchased a No. 2 American Rock Breaker and a No. 2 American Ball Pulverizer from your company about one year ago. The latter part of April, 1893, we started up for regular work, since which time we have run both of said machines to the full extent of our demands and to our entire satisfaction. The first 700 tons of hard iron ore that we pulverized for paint purposes was ground without taking the Pulverizer apart, and without expending one dollar for repairs for either of these machines. Of the 700 tons spoken of, about 200 tons was Lake Superior Specular iron ore, containing some 70 per cent iron; a very difficult ore to pulverize. The remainder was a red fossiliferous iron ore, carrying quite a per cent of silex, which cuts out hubr-stones rapidly. We find that the steel balls, which were when new 5 in. in diameter, now caliper 4⅞ in., and are perfectly round and smooth. The grinding track shows very little wear, and the driving track shows less; in fact, the wear is almost imperceptible. These two machines crush and pulverize more than one ton per hour with less than 12 H. P. We do not know of any Crusher or Pulverizer that can compare with the output of these two machines in quantity, quality, small amount of wear and tear, and like power. In our opinion, you cannot recommend them too highly. Very truly yours,
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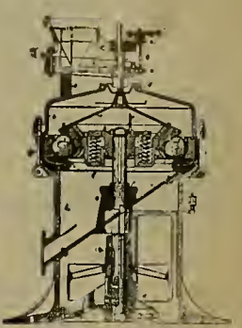

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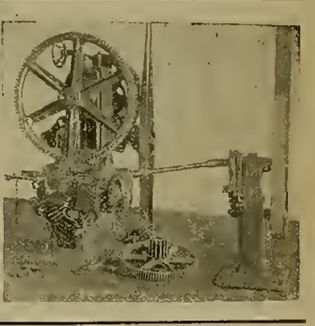

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The Old and the New in Hydraulic Practice.

The wheel illustrated on this page is of the type commonly known as the overshot or gravity wheel, and is unquestionably the largest and most expensive water wheel ever constructed. It is located at Laxey, on the Isle of Man, a small island in the Irish sea, off the west coast of England.

The wheel is 72 feet 6 inches in diameter, and is supposed to develop about 150-H. P., which is transmitted several hundred feet by means of wooden trussed rods having supports at regular intervals, to the bottom of which are attached small wheels running on iron ways, for the purpose of lessening friction. The power thus transmitted operates a system of pumps in a lead mine, the duty of which is raising 250 gallons of water per minute an elevation of 1200 feet. The water is brought some distance to the wheel in an underground conduit, and is carried up the masonry tower by pressure, flowing over the top into the buckets.

This great wheel was constructed some forty years ago, and is said to have been running continuously during all this time. It is the great attraction of the place, hundreds of visitors making the trip to the island every year to see it.

The illustration referred to affords a very good idea of the progress made since that time in hydraulic engineering, and is reproduced for the purpose of showing, by way of comparison, the advantages of the modern and now generally accepted method known as the Pelton system of power.

The little cut in the upper corner represents a Pelton wheel of corresponding capacity under similar conditions of head and water supply, being drawn to the same scale.

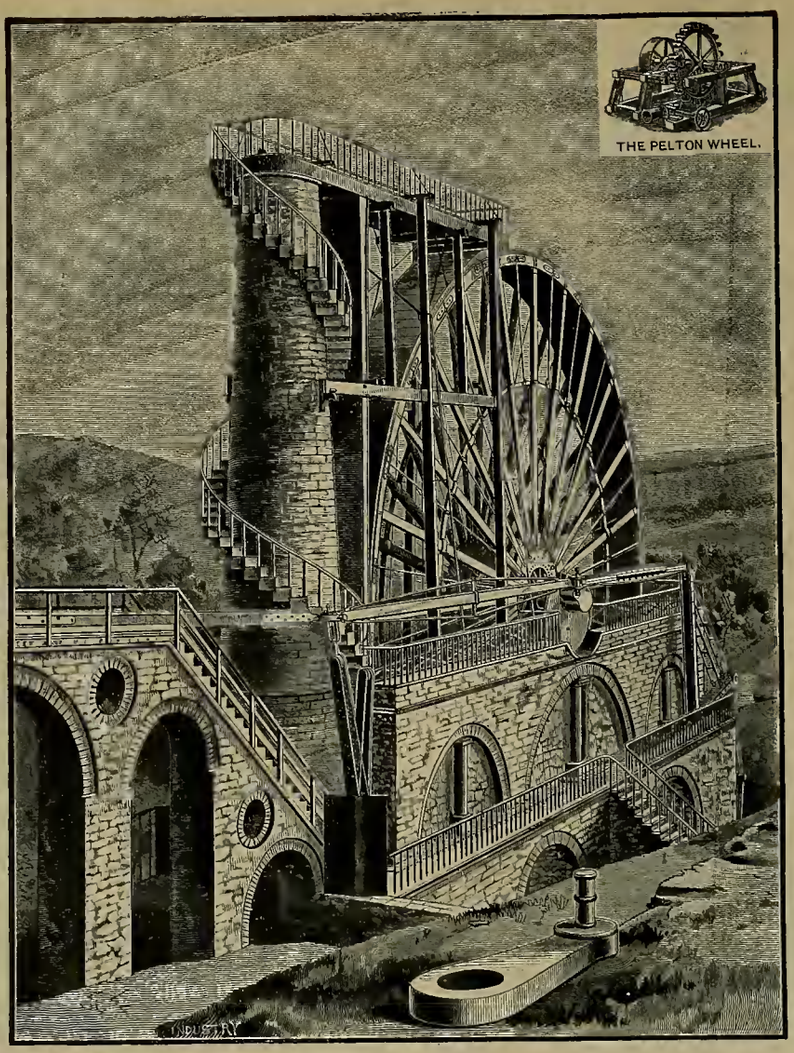
The extraordinary results obtained from this well-known wheel are due to the peculiar shape of the buckets into which the water is directed from one or more nozzles, so that the full energy due to its head or fall is transferred into the inertia of the wheel. The power represented by the force of the water is thus converted into mechanical movement almost entirely without friction, the buckets simply taking the energy out of the stream and leaving the water inert under the wheel.

The efficiency of the Laxey wheel—taking resistance into account—it is estimated cannot be more than 65% of the theoretical power, while the Pelton will develop fully 20% more, and in size and appearance is a mere toy as compared to the ponderous piece of machinery shown, with is massive column, arches, and stone foundations.

The most striking contrast, however, will be seen in the matter of cost, which is so much less as to make a comparison almost absurd. While no data is at hand in regard to this, it is apparent that it would be at least as one to fifty in favor of the Pelton.

Such an object lesson is of value in showing the wonderful progress made in engineering practice during the last half century, in bringing the forces of nature into subjection, making them subservient to commercial and industrial purposes.

The Pelton system of power has now come into use in every civilized country on the globe, and is conceded to be one of the most useful, as well as most illustrious, inventions this country has ever produced, making possible the utilization of this great natural motive force under all conditions and for every variety of service, with a useful effect never before obtained, and in so simple a way that machinery may be said to be almost dispensed with.



THE PELTON WHEEL.

Formosa's Unknown Interior.

The interior of Formosa is apparently still but little known, the Chinese authority being limited to the western coast country, the extreme northern part and a narrow strip of the east coast. The Chinese are gradually working their way inland, cutting down the forests and replacing them with indigo and tea plantations. Much of the soil is extraordinarily fertile. In some places there are three rice harvests in a year, and tea leaves are picked three times—in many places, indeed, seven times—a year. Anthracite coal of good quality is found in large quantities, and close to the sea—a thing of great importance to maritime powers like Japan. Alluvial gold has also been discovered in the beds of some of the northern streams. The Chinese have built a railroad from the port of Kelung, a distance of about 100 miles, to a town near the west coast.

FOR TIRED EYES.—Take a cup brimful of water. Add sufficient salt to be just perceptible to the taste. Hold your eyes to the water so that your lashes touch it, then wink once and the eyes will be suffused. Do not wipe them. This so refreshes the eyes that they feel like a new pair. Do not forget the good old rule—as soon as you "feel your eyes," stop using them. By following this treatment, very little time will be wasted waiting for tired eyes.

MODERN INDUSTRY has a foothold in the Arctic regions. Mines are worked on a large scale and a railroad regularly operated in such high latitudes. This is the case in Sweden, where the Lulea-Gellivare Railroad, built for the purpose of carrying iron ore from the Gellivare mines to the seaport of Lulea, extends fifty miles above the Arctic circle and enjoys the distiuction of being the first railroad to open up the frigid zone.

GLADSTONE computes that the habitual speakers of the English language have increased from 15,000,000 to 105,000,000 during the last 100 years, and that they will number 120,000,000 by the end of the year 1900. At that rate of increase, which is seven-fold each century, such speakers will include not less than 840,000,000 by the end of the year 2000.

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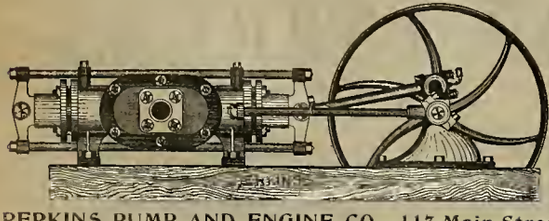

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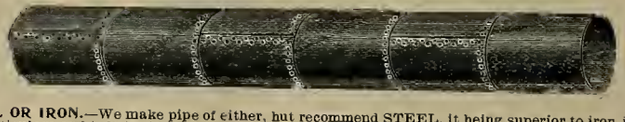

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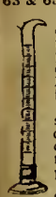
HIGHEST PRICES PAID FOR GOLD, SILVER AND LEAD ORES AND SULPHURETS.

Manufacturers of
BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, ETC., ETC.

Also Manufacturers of
STANDARD SHOT-GUN CARTRIDGES,
Under Chamberlin Patent.

John Taylor & Co.
Importers and Dealers in
Assayers' Materials,
Mine and Mill Supplies.
Also Chemicals, and Physical, School and Chemical Apparatus.
63 & 65 First St., Cor. Mission, San Francisco.



We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc. including, also, a full stock of Chemicals.

M.C.Co BATTERSEA

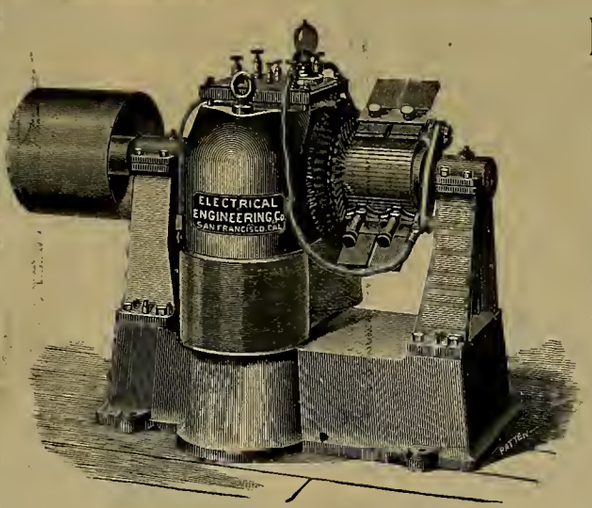
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents of the Denver Fire Clay Co. and for the Morgan Crucible Co., Battersea, England. Also for E. G. Denniston's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.
JOHN TAYLOR & CO.

Power, Mining, Milling, Smelting, Concentration and Leaching Machinery; Return Tubular and Water Tube Boilers, Corliss Engines, Jones' Mechanical Stokers, Hoisting Engines, Riedler Air and Gas Compressors, Riedler Pumping and Blowing Engines, Cornish Pumps, Roots Blowers, Copper Converters, Pyritic Smelters, Horseshoe Roasting Furnaces, Comet Crushers, Crushing Rolls, Stamp Mills, Shoes, Dies, Perforated Metals, Sectional Machinery, Huntington Mills, Frue Vanners, Bridgman Samplers, Concrete Mixers, Heavy Machinery and Mine Supplies. = = Write for Catalogues

FRASER & CHALMERS
CHICAGO, ILL., U. S. A. and
43 Threadneedle St., E. C., London, Eng.

Works at Chicago, Ill., U. S. A., and Erith, Kent, Eng.
Branch Offices: 2 Wall St., New York; City of Mexico, Mex.; 527 17th St., Denver, Colo.; Helena, Montana; Salt Lake City, Utah.



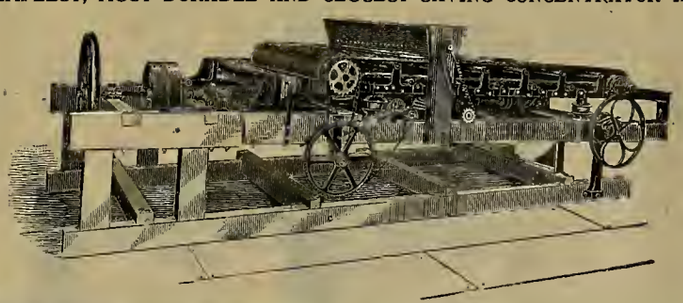
Electrical Engineering Co.,
MANUFACTURERS OF
Dynamos and Electric Motors
FOR THE TRANSMISSION AND DISTRIBUTION OF POWER.
Electric Power Apparatus
FOR
Quartz Mills, Hoisting, Pumping, Drilling,
And all Mining Work where Long Distance Transmission is required
✦✦✦ A SPECIALTY. ✦✦✦
OFFICE AND WORKS: 34 and 36 Main Street, San Francisco, Cal.

The McGlew Ore Concentrator Company.
PATENTED SEPTEMBER 19, 1893. CHEAPEST, SIMPLEST, MOST DURABLE AND CLOSEST SAVING CONCENTRATOR IN USE. FRANK BARRERE, Secretary and Manager

Can be seen in operation at the Company's works, 132 Main Street, San Francisco.
Office, 116 Davis Street.

NINETY-FOUR AND ONE-HALF PER CENT
—SAVED—
ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness combining both Side and End Motion with a Bumping Belt.
SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.
CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.
PRICE.....$350 EACH
including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.
THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.
Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.
Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.
You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works

MINING, IRON AND WOODWORKING
MACHINERY AND SUPPLIES
INGERSOLL-SERGEANT PISTON INLET AIR COMPRESSORS AND ROCK DRILLS
ENGINES AND BOILERS
PARKE & LACY COMPANY
21 AND 23 FREMONT STREET, SAN FRANCISCO, CAL.

Market Reports.

The Markets.

SAN FRANCISCO, May 23, 1895.

There is a general advance and a firmer demand in all the metals. Latest New York advices report considerable excitement in various branches of the metal market and rapid movement in prices. Operations in copper, chiefly in London, averaged over 3000 tons per day. Speculation was stimulated by reports that American producers had decided to limit the amount of copper they would ship to Europe, and that foreign producers had practically agreed to restrict their output about 7½ per cent. In neither instance, however, did anything more than a qualified verbal agreement seem to be made, and it appears that one prominent mining company withdrew from the compact because of improvement in their sales at home and abroad, and favorable outlook for the future.

This was the signal for a bear raid in the London market and the circulation of reports calculated to harm outside operators who are not well informed as to the true situation on this side of the Atlantic, and prices receded in London. Meanwhile considerable business was effected in New York, not only with consumers but among dealers as well. The Calumet and Hecla Company, it is understood, has sold its entire product up to and including July, and some of the other Lake Superior companies are as comfortably situated, while the Arizona and Montana producers are in such position that they do not compete for business as sharply as usual. The increase in consumption of copper has been largest among manufacturers of electrical supplies, but manufacturers of sheathing, brass, tubing, etc., have been enjoying a brisk trade and purchased crude material accordingly.

Pig lead has also advanced, and is about 1⅛c per pound above the lowest point of the year. The impression has prevailed that the National Lead Company were the heaviest buyers, but it is learned on very good authority that such is not the case, and that more lead has been taken up by operators prominently identified with the tin business than in other quarters. The statistical position of the metal is regarded as being exceptionally strong in this country and in Europe, but necessary data on that point is wanting.

In various branches of the iron and steel trades a good business has been effected, and there is some indication of toning up of prices in a few lines, such as track supplies, rolled iron and cast pipe. In structural material the competition is still keen enough to keep prices low, and foundrymen in the East are not as yet fully employed. Crude material has undergone no radical change in price, but the market shows stronger tone.

New York Metal Market.

NEW YORK, May 23.—PIG IRON—Scotch, 19@20c; American, 9.50@12.00c.

COPPER — Brokers', 10.50c; exchange, 10.60c.

LEAD—Brokers', $3.10; exchange, $3.27½.

TIN—Straits, 14.85@14.95c.

SPELTER—Domestic, $3.60.

New York Silver Prices.

NEW YORK, May 23.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	30⅝	66⅞	10 50	.....
Saturday	30⅞	67⅛	10 60	3 22½
Monday	30⅞	67⅛	.....	3 27½
Tuesday	30⅜	66⅞	.....	.....
Wednesday	30¾	67⅛	10 50	3 23½
Thursday	30⅝	67	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	5
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.80
Refined Silver, per ounce	67c
Mexican Dollars, nominal	54

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt	¼ & 5-16, 17c; ¾ and larger, 16c		
Lake Superior Sheathing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17
TIN PLATE.			
Per bx	5 25	@	6 00
PIG TIN.			
Per lb	15	@	16 00
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
QUICKSILVER.			
Home trade, per flask	39 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington	$ 8 00		
Greta	7 75		
Nanaimo	6 50		
Gilman	6 00		
Seattle	7 00		
Coos Bay	5 50		
Cannel	10 50		
Egg, hard	12 50		
Wallsend	7 50		
Scotch Splint	7 50		
Brymbo	7 50		
West Hartley	8 75		
TO ARRIVE—CARGO LOTS.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Alpha Con, Nev	14	5c	May 23,	Jun 27, July 18	C E Elliott, 309 Montgomery
Alta M Co, Nev	49	10c	May 6,	Jun 11, July 2	J E Jacobus, 309 Montgomery
Andes S M Co, Nev	41	15c	May 1,	Jun 1, Jun 17	J W Twiggs, 309 Montgomery
Chollar M Co, Nev	40	25c	May 14,	Jun 15, July 11	C E Elliott, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19,	May 31, Jul 26	J Henry Smith, 431 California
Justice M Co, Nev	59	10c	May 7,	Jun 11, Jun 28	R E Kelly, 309 Montgomery
Mexican G & S M Co, Nev	52	25c	May 13,	Jun 17, July 10	C E Elliott, 309 Montgomery
Ophir S M Co, Nevada	65	25c	April 4,	May 7, May 27	E B Holmes, 50 Nevada Block
Overman, Nev	73	10c	Apr 15,	May 21, Jun 11	Geo D Edwards, 414 California
Savage M Co, Nevada	86	20c	Apr 19,	May 22, Jun 11	E B Holmes, 309 Montgomery
Yellow Jacket, Nev	59	25c	Apr 15,	May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Chollar, Nev	C E Elliott, 309 Montgomery	June 12
Crown Point G & S M Co. Nev	Jas Newlands, 35 Mills Building	June 3
Potosi, Nev	C E Elliott, 309 Montgomery	June 12
Seg Belcher, Nev		June 4

Mining Share Market.

SAN FRANCISCO, May 23, 1895.

Nothing new nor nothing good is reported on the street this week, the "general apathy" still prevailing. The market went lower, the bear clique having things generally their own way. Hale and Norcross sold down to 72c. It is expected that the long-delayed Supreme Court decision in this case will appear about next Thursday, the 30th. Whether an assessment will be in order can then be easier determined.

The following is from "*Money*," a chipper London publication that purports to give "points" on the London stock market. It is illustrative of how our British friends discuss these matters: The Kaffir market continues as steady as silver, and has as good a prospect of improving. A "bull" is always posing as being a friend of the company and of its stock, while a "bear" is supposed to be an enemy. The "bulls" are anything but friends, and so far as any improvement in prices of stock were concerned, they simply killed it. Those who say that any sharp rush in South Africans is bound to have a reaction are better friends to an upward movement than a weak-kneed buyer of five hundred shares who will be the first to sell out directly a slip-back of five shillings takes place. Nor does the trouble always end there, as *his* precipitate and nervous sale causes others to think that he has heard some bad news concerning the mine, and they evince a disposition to realize also, and, after saying to each other at luncheon that "it will be all right," they each slip off by devious bye-ways to their brokers' offices and confide in those ready listeners that they would "like to get out" of the shares—"to get out, in fact, at best." Thus may a mountainous land-slide be manufactured out of a molehill. Nothing supports a market like a good, wholesome, oversold account. Investors may swear that if a certain stock falls to a certain point they, one and all, intend to invest a thousand pounds more in it. But they don't do so, for all that. When the "limit" they have named is coming close, they cancel it by wire to their broker, because they have heard a fresh disturbing rumor. A "bear" talks equally bravely. He "knows the stock is rotten." He "cares not a tinker's curse whether the price rises another ten points." "If it does it will only necessitate his making a larger profit than he has at present fixed in his mind as being content with." He "will sell more on each one point rise." He "will never close except at a thumping profit." But he doesn't do all these things. An incipient backwardation causes some of the pluck to ooze out of the palms of his hands. Day by day he sees the price improving. He bears his next door neighbor, Brown, blandly state that he has bought for investment a few thousand stock. At length the tension becomes rather acute. There seems to be no limit to the advance, and our bold "bear" at length comes in and buys, too, to the great delight of the dealers in the market. Now, who is the best friend to the stock—the "bull" who cracks it up and sells, or the "bear" who deeries it and buys? Let no one think, therefore, that those who induce weak or reckless buying are helping the "boom," or that any critic who tries to check the pace a bit by means of a word of caution is necessarily desirous of breaking it down. To buy and carry over many of the high-priced shares now must be to expose oneself to a sharp fall, or to suck honey off thorns in the event of a profit showing. It requires strength of mind and considerable experience not to re-embark in mining ventures money gained as profit from them. The process of buying mining shares now being adopted by several small people is becoming very amusing. The plan is simply to look out any South African mine whose shares have not risen, and buy five hundred of them. A deal on these lines was made for the current account in Joe's Reef by a buyer who had never heard of the company before, yet who had the temerity to take 500 at 7s 6d. Within the past two days they have risen to 20s.

The above doesn't sound much like Pine street, but exemplifies that a Californian needn't feel lonesome if landed in the middle of the present "Kaffir circus" in London.

Turning from London to Colorado, the following extract from a Colorado Springs letter is likewise interesting:

"Trading locally during the past week was unmistakably spasmodic. The utter absence of Eastern business is painfully noticeable. The new Board of Trade Exchange, recently opened, has undoubtedly greatly stimulated local transactions, but is apparently of little benefit to brokers, as a large majority of the local speculators have identified themselves with it, and consequently save brokers' commissions. This naturally forces the broker to depend more than ever upon out-of-town business. The rates of commission on the new Board are materially less than those of either the Denver or Colorado Springs exchanges. So far as the ordinary speculator or investor is concerned, this new institution is unquestionably of great benefit, and there is no reason whatever why it should not be encouraged by every one. Of course, it may be in a way detrimental to the broker who is conducting an extensive establishment and freely advertising. Again, this may be questioned, as there is a possibility of its creating renewed interest from unlooked-for sources. It must increase local enthusiasm and general confidence. It will have a tendency to overcome the extreme quietness that invariably prevails at this season of the year."

The annual meeting of the Gold Ridge Con. Mining and Milling Company was held on the 20th inst. for the election of five directors for the ensuing year, and resulted in the election of the following: Wm. H. Lillie, C. M. Jennings, Richard Phelan, R. H. Daley, B. F. Ricker, 80,000 shares being represented.

The following illustrates the changes of the week:

MINES.	16	23
Alpha	$ 05	.....
Alta Consolidated	08	.....
Andes	15	$ 12
Belcher	49	50
Best & Belcher	59	47
Bodie	1 00	1 00
Bullion	.....	.....
Challenge	25	24
Chollar	25	25
Confidence	1 10	94
Consolidated California and Virginia	2 80	2 35
Consolidated New York	.....	03
Crown Point	45	51
Exchequer	.....	.....
Gould & Curry	30	28
Hale & Norcross	1 20	90
Justice	.....	03
Mexican	55	42
Ophir	1 60	1 35
Overman	17	17
Potosi	32	37
Savage	16	38
Sierra Nevada	64	52
Union	39	46
Utah	.....	.....
Yellow Jacket	47	52

San Francisco Stock Board Sales.

SAN FRANCISCO, May 23, 1895.

9:30 A. M. SESSION.

250 Andes	11	200 Justice	02
500 Best & Belcher	46	200 L Wash	01
200	45	1000 Mexican	41
100 Bodie	98	100 Mono	60
100	97	100 Con New York	03
100	96	300 Ophir	1 30
100	95	500 Overman	17
100 Crown Point	45	600 Potosi	37
500 Con Cal & Va	2 25	100 Savage	37
10	2 35	100 Sierra Nevada	49
200 Hale & Norcross	83	100 Union	32
300	84	100	33
200	85	100 Yellow Jacket	47

SECOND SESSION—2:30 P. M.

100 Andes	12	50 Gould & Curry	28
400 Belcher	50	500 H & N	90
550 Best & Belcher	47	500 Justice	03
100 Bodie	1 00	500 Mexican	42
300	96	150 Mono	60
200	95	300 Ophir	1 35
100	97	150 Potosi	36
200 Bulwer	05	200 Savage	37
100 Challenge	24	200	38
100 Chollar	24	100 S. B. & M	17
200	25	150 Sierra Nevada	51
400 Con Cal & Va	2 30	250	52
50 Confidence	94	400 Union	33
250 Crown Point	51	450 Yellow Jacket	50
50	50, 25		52

A specialty. Round, slot or burred slot holes. Genuine Russia Iron, Homogeneous Steel, Cast Steel or American planished Iron, Zinc, Copper or Brass Screens for all purposes. CALIFORNIA PERFORATINO SCREEN CO., 145 and 147 Beale St., S. F.

DEWEY & CO
PATENT
SOLICITORS.
90 MARKET, ST. S. F.
ELEVATOR 12 FRONT ST S F

LIGHTNING LARGEST WELL MACHINERY Works.
All kinds of tools. Fortune for the driller by using our Adamantine process, can take a core. Perfected Economical Artesian Pumping Rigs to work by Steam, Air, etc. Let us help you. THE AMERICAN WELL WORKS, Aurora, Ill.; Chicago, Ill.; Dallas, Tex.

Assessment Notices.

H. P. TAYLOR MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Liberty Mining District, Siskiyou county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the nineteenth day of April, 1895, an assessment of Four (4c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, 39 Merchants' Exchange, 431 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the thirty-first day of May, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on FRIDAY, the twenty-sixth day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HENRY SMITH, Secretary.

Office: 39 Merchants' Exchange, 431 California St., San Francisco.

ALTA SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of May, 1895, an assessment (No. 49) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 11th day of June, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on TUESDAY, the 2d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. E. JACOBUS, Secretary.

Office, Room No. 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

ANDES SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia City, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the first (1st) day of May, 1895, an assessment (No. 41) of Fifteen (15c) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Rooms 20-22 Nevada Block, 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the first (1st) day of June, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on THURSDAY, the twentieth (20 h) day of June, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JOHN W. TWIGGS, Secretary.

Office—Rooms 20-22 Nevada Block, San Francisco, California.

THE GOLD and SILVER EXTRACTION COMPANY, OF AMERICA.

LIMITED.

TRADE MARK.

MACARTHUR-FORREST PROCESS

MacArthur-Forrest Process.

CAPITAL, - - - £110,000 STERLING.

To MINE OWNERS and others having Refractory Gold and Silver Ores hitherto untreatable at a profit, the MACARTHUR-FORREST (Patent) Process of Gold and Silver Extraction offers a solution of the difficulty.

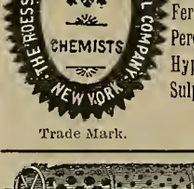
Advisory Board in the United States: Thomas W. Goad, Manager; Hugh Butler, Attorney; John F. Bell; P. George Gow.

California and Nevada Agency and Experimental Plant, 23 Stevenson Street, San Francisco, Cal. P. G. Gow, Sole Agent.

OFFICE: McPHEE BUILDING, DENVER, COLORADO.

THE ROESSLER & HASSLACHER CHEMICAL CO.,

73 Pine Street, New York.



CYANIDE
—OF—
POTASSIUM,

Ferricyanide of Potassium, Peroxide of Sodium, Hyposulphite of Soda, Sulphide of Iron,

And other Chemicals for Mining Purposes.

Trade Mark.

—EASTERN PRICES BEATEN.—

SAN FRANCISCO Pioneer Screen Works!

JOHN W. QUICK, Prop.

Improved Facilities! Finest Work! Lowest Prices!

Perforated Sheet Metals, Steel, Russia Iron, American Planish, Zinc, Copper and Brass Screens for All Uses.

—MINING SCREENS A SPECIALTY.—

221 and 223 First Street, San Francisco, Cal.

Dividends Wanted.

Many paying properties might pay more, and others just paying expenses might pay dividends, if properly managed.

If in need of a thorough, practical manager, of large experience and well recommended, address

BOX L, MINING AND SCIENTIFIC PRESS.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING MAY 14, 1895.

539,162.—TAP FOR BARREL—H. C. Black, S. F.
539,122.—GAS ENGINE—H. J. Dykes, Peralta, Cal.
539,258.—DRYING FRUIT—F. W. Gibs u, Lakeport, Cal.
539,261.—CAN OPENER—J. Gould Jr., Berkeley, Cal.
539,131.—CAR FENDER—H. P. Johnson, S. F.
539,140.—SASH FASTENER—I. W. Lord, Cucamonga, Cal.
539,280.—CAN LABELING MACHINE—E. E. Magee, San Jose, Cal.
539,144.—BUTTER CUTTER R. Packard, Smith River, Cal.
539,398.—NEGATIVE PLATES—W. S. Phillips, Seattle, Wash.
539,291.—VALVES—H. H. Tracy, Hollister, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DOOR OPENER.—Lawrence Dunn, S. F., assignor of one-half to Wm. Dunn, same place. No. 538,900. Dated May 7, 1895. This invention relates to a device designed to open doors, gates and other closures, and is especially adapted for use upon fire-engine houses, where it is necessary to open the doors the instant the horses are attached to the engine or other apparatus. It consists of a gate or door, with levers fulcrumed to the top of the door casing, one of the levers pressing against the door, a link by which the movable inner ends of the levers are connected, a weighted cord for operating the levers and direction pulleys around which the cord passes, a latching device by which the doors are retained in a closed position against the pressure of the lever, and the action of the weights and cords passing over direction pulleys whereby the doors may be released.

CAN OPENER—James Gould, Jr., Berkeley, Cal. No. 539,261. Dated May 14, 1895. This device relates to that class of can openers in which a handled wire or bar has its other end provided or formed with a cutting hook adapted to puncture the material of the can, and when entered to present its cutting edge in such a manner that upon vibrating or working the handle the cutting hook will be caused to move through the tin and to cut said tin as it moves. The object of this can opener is to provide a simple and practicable device adapted to be readily entered into and through the material of the can and to be turned at once to a position in which by the vibration of its handle or shank it can be advanced quickly and certainly in its cutting path around the can, thereby opening it. The device consists of a bar or wire forming a shank, the extremity of which is bent backwardly parallel with and upon itself, and is then flattened and formed into a forwardly projecting hook having its inner edge reduced to a cutting edge, and its extremity projecting beyond the extremity of the shank and reduced to a cutting point.

PROSPECTING

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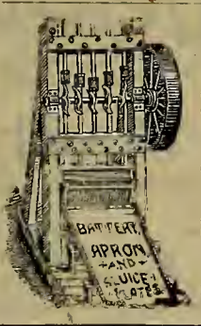

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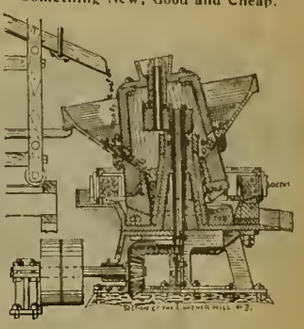

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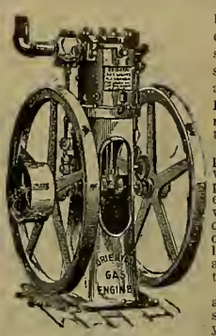

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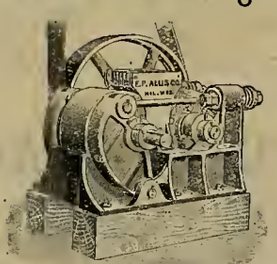

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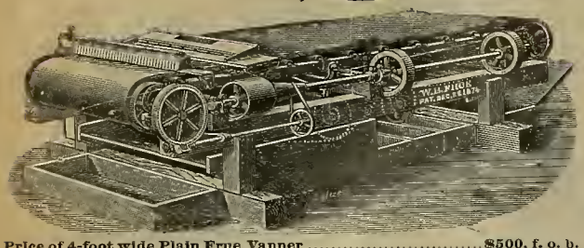

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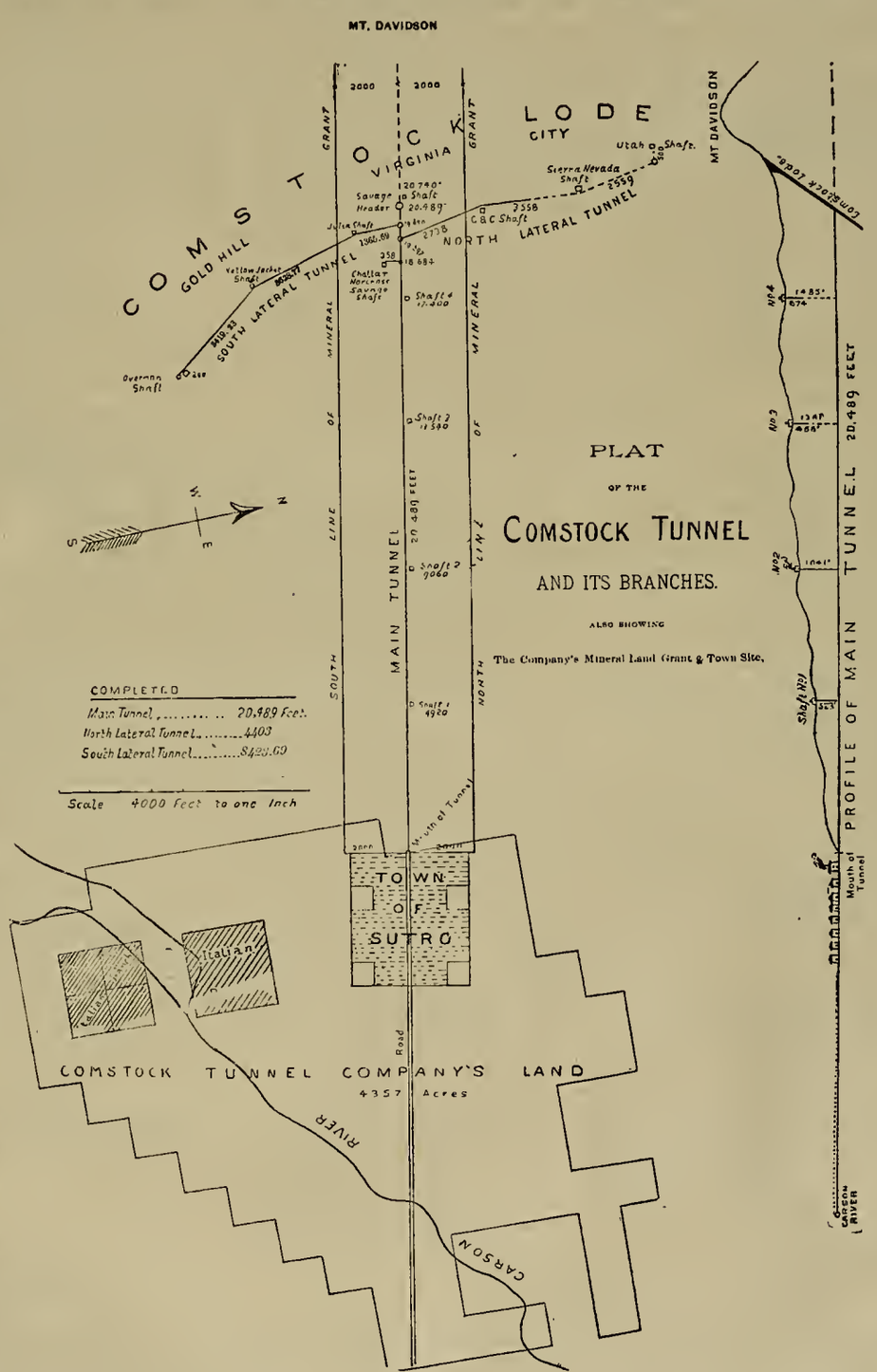
VOLUME LXX. Number 22. SAN FRANCISCO, SATURDAY, JUNE 1, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

New Life in the Comstock Tunnel Co.

At a meeting of the shareholders in the Comstock Tunnel Company (formerly Sutro Tunnel Company) held at New York City on April 25, 1895, the following directors retired: Theodore Sutro, Otto Lowengard, Julius A. Stursberg, Elisha Dyer Jr. and Wheaton B. Kunhardt, and the following were elected: Franklin Leonard, R. H. Hobart Smith, H. H. Truman and Gordon MacDonald. The new directors elected Franklin Leonard president and Gordon MacDonald treasurer. It is semi-officially reported that Mr. Leonard represents large capitalists and Gordon MacDonald represents a Mr. Van Weel of Holland and Robert Fleming of Scotland, while Messrs. Smith and Truman are bankers at New York. This change undoubtedly points the way to far better times in the near future for the mining industry at Virginia City, Nevada, which in turn will give an impetus to mining in the State of Nevada and, as for that, throughout the coast that will bring about an activity to which the industry has been a stranger for many years, and, when an accomplished fact, will produce an era of general prosperity in Nevada and California, with its favorable influence felt in neighboring States and Territories. This opinion is grounded on the fact that ever since the tunnel was in litigation—which is now happily at an end—mining has been only spasmodically active. This, to a large degree, is due to the fact that the mines on the Comstock lode are listed on the San Francisco and New York exchanges, and the shares dealt in at both places. These quotations being given publicity through the press, causes many not conversant with mining on this coast to consider them the "open sesame" to the industry. This opinion is also due to their phenomenal output of gold and silver, aggregating fully $400,000,000. That the tunnel is most unquestionably an important factor at Virginia City will be readily recognized when it is considered that it drains the Comstock and several other lodes at a depth which makes it possible for the mines to be worked at a large reduction in expense and deeper, if found necessary, than they possibly could be otherwise. In its construction it took fully nine years—from October, 1869, to 1878—before the main tunnel was completed to the Comstock lode, a distance of 20,489 feet. The lateral tunnels which follow the trend of the lode uorth and south were constructed since. The south lateral tunnel was extended to what is known as the Forman shaft, a distance of 8423 feet from the main tunnel, and the north lateral tunnel was extended a distance of 4403 feet up to the Mexican Mining Co.'s ground. These combined with the main tunnel make a grand total of 33,315 feet, or over six and one-third miles, fully completed aud equipped for working purposes. It is furnished throughout with car tracks and side switches, drain boxes and ditches to carry off the water, ventilating shafts, partitions, and everything necessary to make it complete in every respect. The height of the tunnel is generally from seven to seven and onc-half feet and the width throughout eight feet at the top of inside timbers and nine to nine and one-half feet at the track rails ou the outer bottom. A better idea can be formed of the tunnel by the plat or drawing herewith shown. Compared with similar tunnels in other mining districts the Comstock tunnel is a small affair, but when pushed to its full contemplated length (three miles further than now completed), with its many lateral tunnels, it will take rank as one of the longest, most thoroughly built and best equipped now in existence. The greatest adit or drain tunnel is at the United Mines, near Redruth, in Cornwall, which, with its branches, has a length of thirty miles. This tunnel has been in use ever since the year 1768. The next longest is the Ernst August tunnel, which has a length of fourteen miles, and which drains the mines in the Hartz mountains, Germany. Although the Comstock tunnel takes rank as the third largest of a similar kind in the world, it outranks all others in the number of distinct lodes run through, area of untold wealth and value of its



(Continued on next page.)

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J. F. HALLORAN.....General Manager

San Francisco, June 1, 1895.

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THE full text of the new Mexican mining law is published elsewhere. Senor Romero, the Mexican Minister, says that the intent of the bill is to distribute over the whole of that country's mining industry the high duty now levied on silver mining. If it tends to keep Mexican lead and copper out of this country, as would appear from its provisions, American producers of those metals will not object.

SO MUCH has been said first and last in these columns about the mineral area of the State and its attempted perversion, the effort on the part of the miners to prevent its absorption, and the progress of the work, that little remains to say beyond urging a full attendance at the meeting of the Executive Committee of the Cal. Miners' Association at the Palace Hotel in this city next Thursday evening. Such communications as that of Mr. Bell, of Shasta, published elsewhere, illustrates the spirit and sentiment of the California miner. The recent attack "all along the line" of the Sacramento papers (and all the other papers of the State that could be coerced or influenced) on the mining interests of the State in general illustrates the spirit and sentiment of the corporation that evidently influence such utterance. The cuttlefish tactics that darken the waters of debate are again employed; but, undismayed by the private and public activity of their wily antagonist, the Miners' Association will go on in successful effort to thwart corporation absorption and secure manifest justice for the commonwealth, in whose interests, in the larger sense, the present contest is being made.

THE country's railway tonnage is something stupendous. The whole of the tonnage on the oceans of the world last year aggregated 140,000,000 tons; the tonnage of the railway companies of the world, carried 100 miles, aggregated 1,400,000,000 tons. There are 400,000 miles of railroad in the world, of which 180,000 are in the United States. Of the 1,400,000,000 tons carried 100 miles last year on the railways of the world, 800,000,000 tons were carried on the railways of the United States. Take the 600,000,000 tons carried 100 miles on the railways of the world outside of the United States, and add to it 140,000,000 carried on the ocean in the commerce of the world upon the seas, and still in the 800,000,000 tons carried on the railways of the United States there are 60,000,000 tons more than on all the railways of the world outside of the United States and in all the ocean commerce of the world put together. This traffic is carried by the American railway at an average of eight mills per ton per mile: the railways of Great Britain charge two cents and eight mills; France, two cents and two mills; Germany, two cents and six mills; Italy, two cents and five mills; Russia, two cents and four mills. The internal commerce of the United States makes our country the most wonderful market this globe has ever known.

New Life in the Comstock Tunnel Co.

(Continued from preceding page.)

franchise rights given by a special act of Congress, passed July 25, 1866. This act, whereby the right of way is granted, reads as follows: "For the purpose of the construction of a deep draining and exploring tunnel to and beyond the Comstock lode, so called, in the State of Nevada" * * * commencing "at the hills near Carson river * * * and extending from said initial point in a westerly direction seven miles, more or less, to and beyond said Comstock lode; and the said right of way shall extend northerly and southerly on the course of said lode, either within the same or east or west of the same, and also on or along any other lode which may be discovered or developed by the said tunnel." The act also grants the right "to purchase, at one dollar and twenty-five cents per acre," public land, "not exceeding two sections" near the mouth of the tunnel. It also gives "the right to purchase, at five dollars per acre, such mineral veins and lodes within two thousand feet on each side of said tunnel as shall be cut, discovered or developed by running and constructing the same, through its entire extent, with all the dips, spurs and angles of such lodes," etc. The Comstock lode and all other lodes, "at the passage of this act in the bona fide possession of other persons, are excepted from such grant;" but such lodes, if not worked as provided by law, become subject to such right of purchase. * * * It is also further enacted "that all persons, companies or corporations owning claims or mines on said Comstock lode or any other lode drained, benefited or developed by said tunnel," shall contribute and pay to the owners of said tunnel for benefits derived such charges as shall be agreed on by and between said owners and the companies representing a majority of the estimated value of the Comstock lode at the time of the passage of the act. The agreement made in conformity with the act carried certain fixed charges on every ton of ore extracted and milled, being $2 a ton on all going above $40 a ton and $1 on all going below $40 a ton. There was also to be collected 25 cents a ton on all ore, rock, earth or debris removed through the tunnel, besides collecting fare on each person carried and on all freight transported. About two years ago the charges for ore extracted, reduced or sold were reduced by the late owners to four per cent royalty on the net proceeds of all bullion extracted and 40 cents a ton on waste sent out through the tunnel. This reduction makes it possible to mine low-grade ore at a profit, and induce mining for the latter instead of extended dead and prospecting work which did not yield a revenue, except in isolated instances, to the tunnel company and only brought assessments to shareholders in the different mines. The litigation between contending interests for the Comstock tunnel placed the mining companies in an unenviable position, one that did not either encourage mining below the tunnel level by pumping, or extensive prospecting or developing (outside of keeping the industry alive) work above the tunnel level, owing to their not knowing into whose hands the tunnel would fall, by whom it would be allowed to go into disuse and eventually be abandoned or else prosecuted still farther west through Mount Davidson, with more necessary branch tunnels built so that mining can be better prosecuted with safety, less expense and more advantageously. With the change in ownership, as noted in the fore part of this article, comes assurance that capital is at its back and fears need no longer be entertained that the tunnel will not be pushed to completion in all directions, admitting of more thorough working of the different mines and extraction of ore which would not in preceding years pay but which will now, under cheapened charges for tunnel royalty, transportation and milling.

To more fully determine the importance of the tunnel, with its valuable franchise rights, it is only necessary to trace results in prosecuting the work of extension, together with seemingly well authentic statements regarding the large deposits of low-grade (gold-bearing) ore discovered by the different mines located on the Comstock lode, which can be, and unquestionably will be, extracted and reduced under a better condition of affairs after the new owners of the tunnel get well under way. In extending the main tunnel the Star or Bella Union lode was struck at a point 10,500 feet from its mouth. From this lode fair assays were secured from the vein matter encountered. Farther on, say about 1000 feet, at a depth from the surface of 1361 feet, the Brunswick or Monte Cristo lode was struck. This lode increases in width as depth is obtained, being about 100 feet wide at the tunnel level. It is said to be a strong vein and known as a true fissure. On the surface it has been traced by croppings for a distance of over two and a half miles. On this lode is located the Monte Cristo mine on the north and Occidental on the south. It is estimated that fully three-quarters of a million dollars in bullion have been taken out near the surface. It is stated by mining experts that fully 2,000,000,000 tons of low-grade ore are contained within the boundaries of the Brunswick lode, which, at the low estimate of $5 a ton, would mean in bullion ten billion dollars. The next lode struck was the Solferino, and, still farther on, distinct vein matter was struck. The above lodes, like the Comstock, dip easterly at an angle of about forty-five degrees. In running the south lateral tunnel, at a distance of 4035 feet from the end of the main tunnel they struck east of Yellow Jacket, a vein was struck having an average width of nine to thirteen feet, named the Garfield lode, which gave an average assay value of nearly $18 to the ton. Owing to the lack of funds the different finds have not been prospected to any extent, therefore they remain largely an unknown quantity. What will follow extensive and thorough prospecting work on the veins cut by the tunnel, and what new veins might be cut and discovered by running drifts in various directions along the main and lateral tunnels, is largely problematical, without taking into consideration what is liable to be found by extending the main tunnel three miles farther west and passing under Mt. Davidson at a depth of 3600 feet below its summit. A fair idea of what can be found in its extension through Mt. Davidson can be formed by what has been discovered on the surface, but which, owing to water interference, could not be worked to any depth. This, of course, will be overcome by the tunnel being extended so as to give drainage facilities.

A late map of the Comstock lode and mines located on it shows the Virginia or Red lode lying to the west. The West Con. Virginia and California mine are running for the latter lode. This work was commenced on the 1100-foot Con. Virginia and California mine. It is expected that this drift will strike the Virginia lode about 1600 feet west of the Comstock lode and at a depth of 1600 feet. In extending the Comstock tunnel this lode would be struck at a depth of about 2400 feet, which will give ample drainage facility so as to admit of its being opened up and the mines located on it worked advantageously to that depth. According to mining men well informed of the different lodes in the Comstock mining districts, the Comstock tunnel in its extension west would run respectively through the following lodes before getting under Mt. Davidson: Middle, Virginia or Red and Cole. These are called gold-bearing lodes, as the percentage of silver in the ore is small. It is the belief with mining men that the two last-named lodes will be found to be very rich in gold and yield immense wealth to the owners of the mines located on them when the tunnel is pushed west so as to drain them. What is on the west side of Mt. Davidson is largely problematic, but there are those who contend that if the tunnel is pushed under and on through Mt. Davidson some important and valuable gold-bearing lodes will be run into.

Intimately connected with this new life in the Comstock Tunnel Co. is the present effort making to infuse vitality into the life of the Comstock lode itself. The matter has taken definite shape, and includes a proposed amalgamation of interests in this direction of the Con. Cal. & Va., Gould & Curry, Hale & Norcross, Best & Belcher, Chollar, Potosi, and Savage, to acquire joint control of the Brunswick, lying about a mile east of and parallel with the Comstock. The idea is to buy 5000 feet of the Brunswick lode, including the St. Johns claim, 2900 feet southward of the tunnel, and the Alahama and Bailey claims, which extend 2100 feet northward. At the meetings so far held there has been unanimity of action, though it is probable the first

named of the seven will not finally conclude to be an active participant. Should there be the proposed pooling of issues there will be considerable consolidation and lessened expense in company management, etc., and a pro rata sharing of expenses and profits in developing the property purchased. In the outlined development of the property under consideration the Comstock tunnel plays a prominent part.

The following are the depths from the hoisting works of the leading mines to the level of the Comstock tunnel or its branches; also the angles of the inelines, where there are inelines from the bottoms of the main vertical shafts:

Utah, 1465 feet; angle of incline, 46°; Sierra Nevada, 1501 feet; Union shaft, 1502 feet; Ophir, 1600 feet; pitch of ineline, 37°; C & C shaft, 1510 feet; Con. Virginia, 1625 feet; Bonner shaft (Gould & Curry mine), 1676 feet; angle of incline, 55°; Gould & Curry and Best & Belcher shaft, 1448 feet; Savage shaft, 1650 feet; pitch of incline 38¾°; Hale & Norcross, 1626 feet; pitch of ineline, 40¼°; Chollar-Noreross-Savage shaft, 1598 feet; New Yellow Jacket shaft, 1513 feet; Old Yellow Jacket shaft, 1430 feet; angle of incline, 45°; Old Bullion shaft, 1766 feet; angle of incline, 41½°; Con. Imperial, 1732 feet; angle of ineline, 43½°; Crown Point, 1394 feet; angle of incline, 35°; Belcher shaft, 1449 feet; angle of incline, 33°; Overman shaft, 1201 feet; Forman shaft, about 1495 feet; Caledonia, 1153 feet; Alta, 1030 feet; Justice, 930 feet; pitch of incline, 40½°; Silver Hill, 757 feet; pitch of incline, 38°; Old Chollar-Potosi shaft, 1695 feet; pitch of incline, 45°; New York, 1059 feet; Baltimore, 1205 feet; pitch of incline, 38°. These measurements are from the surface of the ground at the top of the shafts.

Concentrates.

DENVER, COL., figures its population at 157,693.

WELLS, FARGO & Co. ceased carrying letters last Saturday.

THE Crizzly Mining Co. of Ruby Hill, Nev., will shortly resume operations.

THE Cumberland & Osceola Placer Miaing Co. (Nevada) will resume work about July 1st.

THE mill of the Gold Ring mine, in Green valley, near Dutch Flat, was burned last Monday. Loss $5,200.

JEFFERSON CLARK, a former Grass Valley resident, has a contract to electrically light Johanneshurg, South Africa.

S. J. MURPHY, working in the Hope mine, at Basin, Montana, was crushed to death last Sunday hy a mass of falling ore.

AT a meeting last week the miners of Willow Creek, Idaho, resolved not to allow saloons, Chinamen or sheep within the district.

NINETY-FIVE hydraulic mines are now in operatiou ia that portion of the State covered by the provisions of the Caminetti act.

THE Weber mine, at Lakeview, Idaho, of which Geueral R. A. Alger is president, is working a small force of men and running ten stamps.

THE $283,000 suit for damages brought by the Standard Cou. Mining Co. against the Bodie Con. M. Co. will he fought to a finish by the directors of the latter company.

A GREAT number of prospectors are said to be heading for the Grand Canyon of the Colorado, where some good prospects have been reported in that hitherto unexplored region.

THE Walter C. Hadley Company, of Denver, are agaiu reported to have hought the Mammoth gold mine, in Pinal county, thirty miles south of Casa Grande, Arizona, for $35,000.

THE Azusa, Cal., *Pomotropic* says the Glendora Milling Company has sold its interests in the Christie mine to Denver parties for $25,000. The Christie is an extension of the Rose mine.

NOTICES of mining locations are heginning to come iato the recorder's office at Whatcom, Wash., from the Slate creek district. It is reported that there are over 3000 people there already.

W. S. STRATTON, the Cripple Creek miner, has given $3000 to Mrs. Charles Clark, widow of the foreman of the Golden Eagle mine, who died last week. He also paid all funeral expenses.

THE Horsefly Hydraulic Company in Carihoo, B. C., is locally credited with an intention to "explode a mine of giant powder of 40,000 pounds to reduce the conglomerate so the monitor can handle it."

LAST Tuesday's Nevada *Transcript* strongly urges the miners of Nevada county, as a public duty, to contrihute that county's quota to the funds of the California State Miners' Association.

WM. H. BOLTNOFF, of Denver, was charged by Geo. F. Wheeler, a West Virginia capitalist, with "salting" two placer claims, and at the preliminary examiriation was honorably discharged.

THE Princess Mining Company has incorporated at Oroville; capital stock, $500,000. Directors—H. J. Milburn, G. H. Thomas, Detroit, Mich.; F. O. Goodwin, San Francisco; E. Harkness, J. Gale, Oroville.

IT is reported from Ensenada, Lower California, that Gen. Humphrey and H. E. Wood propose establishing a fifty-ton smelter near there, and that they will reopen the old San Fernando copper mine helow San Quintin.

AFTER five years of continuous working, the Arivaipa mines, Graham county, Ariz., have closed down. The workings have reached a depth of 580 feet and can be sunk no further with heavier machinery to handle the water.

THE *Inter-Mountain* says: "Though there are many idle men here, it is probably true that Butte is the most prosperous town in North America. It will produce this year 200,000,000 pounds of eopper, $5,000,000 in silver and $2,000,000 in gold."

INSTEAD of the usual military pageant, Sacramento will have a grand electrical display on the Fourth of July. The occasion will be made one of celebration over the introduction of a 4000-horse power electric current from the big American river dam near Folsom.

W. C. RALSTON, secretary of the State Miners' Association, delivered an interesting address last Saturday night before the Miners' Union at Grass Valley, urging the members to assist the State Association in their fight to protect mineral lands of the State.

A SPOKANE, WASH., dispatch of May 29th says: "The Kansas City Smelting Company purchased the Cliff mine at Trail Creek to-day, paying for it $110,000. A recent strike in the mine disclosed an ore vein eighteen feet in thickness, yielding assays of $78 in gold to the ton."

THE Weaverville, Trinity Co., *Journal* says: "The Bully-choop mine has been bonded to an Eastern syndicate for a period of ninety days for $500,000. If, at the expiration of the time, the syndicate decides to take the mine, one-third of the above amount is to be paid, the balance later."

THE cost of producing an ounce of fino gold from the Independence, Col., mine for the four months of this year has been $1.25; from the Victor, for over two years, $5.87; from the Portland mine, for the past nine months, $6; and for fourteen days in March last, from the Bogart claim, 95 cents.

IN 1891, says the *Review*, there were 13,000 miners engaged ia mining in Colorado. By midsummer of 1892 the number had been reduced to about 8000. Midsummer, 1894, saw about 6000 again employed, mostly, however, in leasing. In all probability the best obtainable records will show about 8000 engaged the coming summer.

THE Morning mine, in the Cœur d'Alenes, which was recently run on the co-operative system, has been leased by the Messrs. Longmaid, who commence work this week. They have investigated the property and concluded to pay $3.50 to all hands. It is thought that the Bunker Hill & Sullivan Company will come to the same conclusion sooner or later.

THE Redding *Democrat* has an advertisement of the S. P. Co.'s intentiou to apply for patent to certaia lands, of which the following are in Trinity Co.: Township 33 north, range 10 west, NE¼ of section 15; all of section 21; N½ SW¼ N½ of SE¼ and SW¼ of SE¼ of section 25; W½ of NE¼, NW¼ and SW¼ of section 27; all of section 33; township 38 north, range 8 west, E½ of section 21.

A NEW YORK dispatch of last Wednesday says that the petition for an order to show cause why the Western Nevada Miniag Company should uot be voluntarily dissolved was presented to Chief Justice Daily in the special term of the Supreme Court the previous day. The company was formed with a capital of $250,000 to purchase, work and develop certain mining claims in Esmeralda county, Nevada.

IT SEEMS, says the Colorado Springs *Gazette*, that there are two factions among the miners at Cripple Creek. The Cœur d'Alene men now number about 200, and they have run things with a high hand, but the old Colorado men don't care to be dictated to longer hy the Montana outfit. As a consequence there is bad blood and much feeling. The killing of Jack Smith and George Pohst, two of the Colorado division, has intensified it.

J. W. ARTHUR, vice-president of the Negro Creek Nickel and Copper Miniug Company of Leavenworth, Wash., says: "The deposits of nickel ore in the Negro Creek, Ingalls Creek and Ruby Creek districts is simply wonderful. Negotiations are now under way for the construction of a smelter somewhere near these mines for the treatment of this ore; and if we are successful—and present indications are favorable—there will he a mining hoom over there."

THERE is trouhle over the Magalia, Butte Co., mine. Years ago the shaft filled with water, but recently, at considerable outlay, a new shaft was sunk 300 feet, and, local reports assert, $100,000 was about to he invested in further development when a company of men "jumped" the ground and filed a location, under the name of the Trilby placer mine. Now, litigation and vexatious expense ensues—another instance of the necessity of securing a U. S. patent to a claim.

BECAUSE of alleged failure to comply with the requirement of paying the five per cent export duty on gold sent out of Mexico, the Mexican Government last week notified American placer miners at Juarez, a few miles south of the line, that they must buy the land occupied for mining purposes, at the rate of $250 per acre, or get out. Some have gone, and the remainder are undecided whether to leave their claims or fight. The matter seems susceptible of arhitration.

THE Col. North-Londonderry collapse has largely affected the promotion of mining companies in West Australia, for though it is certain that there were a score or more companies whose prospectuses were ready for publicatiou, it has in most cases been deemed advisable not to go to the public just yet. Of the seven companies who have done so, six refer to the Coolgardie district and the remaining one to the Murchison gold field, and a total capital of £759,000 has beeu asked for. In March the capital of the companies promoted was over one million sterling.

A WRITER in an Eastern contemporary furnishes statistics showing that the market price of chemically pure cyanide of potassium has fallen in eighteen years from $1.50 per pound to fifty cents, and concludes that this has had as much to do with the commercial success of the cyanide process as the invention itself. But that is like the man who drank because his wife had hysterics, the cause of the wife's hysterics being because her hushand drank. The invention is the cause of the demand, and the increased product by reason of this demand the cause of the decreased price.

BARON DE CHOISY, representing the Society of Industries, Mining and Sciences, of France, M. Bourgade, editor of the Paris *Matin*, and D. L. V. Browu, a mining engineer, have been examining mining properties in Amador and Nevada counties with a view to purchase, and have about closed a purchase on hehalf of French capitalists of a mining property near Grass Valley. Francc is investing considerahle at present in South African mines, but is not oblivious to the fact that California possesses solid attractions for profitable investment. French capital has recently gone into Shasta and Trinity counties.

REGARDING the Nevada Co. Electric Power Co.'s operation, A. Tregidgo is in Nevada City this week and has made arrangements for preliminary work. A contract has been placed for the plant. The *Union* says: "The capacity of this machinery will he 2500-horse power. Of this, 800-horse power will he developed with the least possible delay, and hy wire it will be transmitted to Grass Valley aad Nevada City, there to be employed for any purpose desired. It is expected that by the 1st of October, at furthest, electric power will he conducted into the two principal cities of the county from the site of the works, on the South Yuba river.

ONE DAY last week Alex. Budlum, who owns a block of stock of the Bullion-Beck (Utah) Co., nsked the secretary of the company to let him look at the books. The secretary declined, whereupon the San Francisco man gave him his choice—to show the books or go to jail. Sectiou 4691 of the Territorial Penal Code says: "Every officer or agent of any corporation having or keeping an office withia this Territory, who has in his custody or control any book, paper or document of such corporation, and who refuses to give to a stockholder or member of such corporation, lawfully demanding, during office hours, to inspect or take a copy of the same, or of any part thereof in a reasonnble opportuaity so to do, is guilty of a misdemeanor." The secretary didn't go to jail.

THE Bimetallic and Granite Mountaiu mines, at Granite, Montana, have closed down, throwing out of employment nearly 800 men. The properties are owned by St. Louis men, who give the low price of silver as the cause for the stoppage of work, claiming they have operated the mines at a less for some time. It is thought that the Combination, the only other mine near Granite, will be shut down, as the men have rejected a proposition to continue work at reduced wages. There has been a great deal of friction between the mining companies and the people of Granite for many years. The directors of the Bimetallic have decided that should work be again resumed, the mine will be drained through the big tunnel, which at present lacks but 200 feet of connecting with the workings of the mine. They believe that the water can he drawn off by means of a diamond drill, and thus save a large amount of money, which otherwise would have to he expended in keeping the mine dry during the shut-down.

IN the Bassick mine suit at Quiride, near Silver Cliff, in Custer county, Col., in the United States Court, Judge Riner has found for plaintiff, Joseph Staples, and held that the defendant, Dennis Ryan of St. Paul, now in possession was not entitled to hold the property. The mine formerly belonged to the Bassick Mining Company. The last year it was in operation it produced over $900,000. The stockholdors became involved in a row among themselves, and the result was that in 1887 the property was sold under executions. The plaintiff in the suit, James Staples, claimed the property under one judgment, and the defendant, Ryan, now in possessiou, under another judgment. Judge Riner's decision places the title in Staples' name. The mine is now under 1900 feet of water, and it is estimated that it will cost to put the property in operation hetween $100,000 and $150,000. The decision leaves the property still in the hands of Mr. Ryan upon bis filing a bond with the court, which will he done as soon as possible. The case will be appealed.

AT last Monday's meeting of the California Debris Commission a permit was granted Steele & Co., who have recently completed a restraining stone dam at their mine near Brownsville. On iaformation from Deputy United States Debris Commissioner W. W. Waggoner, who made recent personal examination, five hydraulic mines were ordered shut down. All of them are in Plumas county. They are the Mohawk, owned by S. Sorocco; the Garfield Flat, P. Rossi; the Grizzly Bear, L. Lorenzo; the Illinois, Messrs. Buckley & Hellman, La Porte, and the Holloway. Messrs. Gould & Speucer, Gibsonville. In the case of the latter, water and debris escaping through a tunnel to a stream near by was assigned as the cause for withdrawing the permit; at the Holloway mine the restraining dam was considered by the inspector insufficient; in the cases of the other three, leakage of the dams necessitated the closing of operations, in the judgment of the commission. Should the owners of the mines thus closed desire to resume it will be necessary to construct restraiuing works that shall he considered sufficiently strong by the commission and make re-application to resume, when, upon inspection, if satisfactorily reported upon, the permits in each case will he issued, uot as a renewal, but in the same form throughout as though issued for the first time.

Books Received.

"*Self-Culture*," The Werner Co., Chicago and New York. A large portion of this is devoted to "The Story of Human Progress." It starts with the proposition that instead of one great ice age there were six ice ages in primitive times; six different epochs of terribly Arctic cold over a great part of the globe, with incalculable accumulations of snow and ice, ice caps immensely broad and deep and heavy, and glaciers of vast reach and weight, under the effects of which, or in connection with which, continental areas sank below the waters of the seas and sea bottoms were raised far above sea level, alternating with tropical eons of time when fervid heat melted those ice caps and made all earth glow for ages. It also combats the Darwinian theory of ascent or descent, and argues that to accept his account of the origin of man denotes "limited comprehension and unlimited credulity." The idea of the author appears to be that man is developed from a variety of animal progenitors, each of the great races being developed from a race of anthropoid apes. The break in development from highest ape brain to the lowest human brain has never been satisfactorily explained. This author assumes that apes of higher development than any now living may have become extinct, which is an easy way to get around the question.

"*Manufacture of Tin Plate Abroad*" is a compendium of consular reports received from the Government Bureau of Statistics. It gives a more or less exact account of the mode of tin-plate manufacture in Austria, Belgium, Liege, Paris, Rheims, Berlin, Chemnitz, Dusseldorf, Bristol, Cardiff, Liverpool, Swansea and other European points. Those reports are always valuable, containing information accorded our official representatives, and transmitted, usually, in an impartial, unprejudiced way. The one before us makes clear the many difficulties that lie in the way of the American tin-plate manufacturer. The report of Lorin A. Lathrop, U. S. Consul at Bristol, England, is particularly interesting. He sends a report upon the tin-plate industry of South Wales, and says: "The answers, obtained with some difficulty, come from three independent sources. Though tersely expressed, they contain information that is usually guarded with the utmost jealousy." The facts and figures sent by Mr. Lathrop are comprehensive and evidently authentic, and the tables showing relative cost of production demonstrate that the item of wages of skilled workers is one of the great factors in the advantage possessed by the Cardiff manufacturers. Incidentally it is shown that while the exports of tin plate to the United States for the six months eading June 30, '93, aggregated in value $10,234,438, the exports for the corresponding six months of last year aggregated but $5,984,413.

Further Notes on the Gold Ores of California.

Written by H. W. TURNER.

Some brief notes were published in the *American Journal of Science* on the gold ores of California in June, 1894, and the following may be considered as an appendix to that article:

Gold in Barite.—During the past summer the writer examined some gold veins on Big Bend mountain, in Butte county, California, and found that one of them was of an unusual character. The vein is known as the Pinkstown ledge. It is located about a half-mile due south of the highest point of Big Bend mountain (Bidwell Bar atlas sheet). The ledge strikes N. 13° W. and dips at a high angle (about 80°). It is from two to three feet wide where best exposed at the north end, and is composed of a soft, heavy mineral, some of which is coarsely crystalline, with a granular structure, but most of it is finer grained with a schistose arrangement of the granules. No single crystals of the minerals were noted having a greater maximum diameter than five-eights of an inch. Some of them show plainly a characteristic cleavage. Dr. Hillebrand made a chemical examination of this soft mineral and reported it to be barite. Three sections of the barite were examined microscopically, and these show that when fresh there is scarcely any impurity in the mineral, and in fact no other substance was noted except scattered minute reddish opaque grains, which, as seen under the microscope, are reddish-yellow by reflected light, without metallic luster. They may be limonite. Many of the barite grains show distinct cleavages, which appear in the thin sections to intersect at nearly right angles. A tendency to a radical structure like that of epidote was noted at several points. The relief of the barite is rather high. A sample was examined for gold by Dr. Stokes, who reported that "the barite contains gold but too small in amount to be determined in the wet way." There is said, however, to be enough gold in the deposit to pay to work, and the writer understood that the owner of the ledge obtained gold from it by grinding up the ore in a hand mortar and panning it.

A considerable part of Big Bend mountain, as exposed along the road from the bridge over the west branch of the north fork of the Feather river to the abandoned village of Big Bend, is made up of clay slates, probably Paleozoic in age, with layers of greenstone schists, representing original angitic tuffs. The rocks along the east and south base of the mountain, as seen along the river (the north Fork of the Feather), are almost entirely greenstones, with one or two layers of sedimentary mica schists. These greenstones are largely amphibolitic rocks representing original surface lavas and tuffs, probably angitic porphyrites, but now containing little or no angite. The exact nature of the schist enclosing the barite vein was not determined. The south extension of the Pinkstown ledge, owned by Clarke, was examined, but no barite was found, the rock on the dump being a white, fine-grained schist, with a greasy feel. This, as seen in this section, is composed chiefly of minute, brightly polarizing fibers, perhaps talc, with numerous minute cubes of pyrite, arranged in rows.

Gold Associated with Talc Schists.—The magnesian rocks of the Sierra Nevada consist chiefly of serpentine and talc and chlorite schists. All of these rocks, together with some others of similar origin, are frequently found in the same area, the different varieties alternating rapidly in a perplexing manner. There are, however, especially in the area of the Bidwell Bar atlas sheet (Butte and Plumas counties), very considerable streaks of talc and chlorite schists with little or no serpentine. It has been noted by the writer that while quartz veins are very common in the talc-schist belts, they are very rare in the serpentine. Veins containing gold and forming pocket mines do exist in the serpentine areas, but in the two examples which the writer has himself seen there is talc schist directly associated with the vein, forming one or both walls.

One of the veins here referred to occurs on the Downieville sheet in Sierra county, on the spur north of Rock Creek and one and a half miles east of Goodyear's Bar. Here is a small quartz vein in serpentine with talc schist forming one wall. This vein had evidently been worked for gold, and the writer was informed that a gold pocket was found in it.

The other mine is in Mariposa county, on the Mariposa estate, and is in charge of Mr. Ludwig, who kindly showed me the deposit. There is here a streak of talc schist in serpentine near the west border of the large belt of that rock that extends from near Princeton to Mariposa, forming the high ridge just west of the latter town. The exact locality is one and three-fourths miles, a little south of east from Princeton. The deposit consists, besides the talc, of white dolomite, looking precisely like that associated with mariposite at the Josephine mine, near Bear Valley, pyrite and a black mineral, the latter occurring in plates with metallic surfaces in the dolomite. This black mineral was determined by Dr. W. F. Hillebrand to be titanic iron ore (ilmenite). The gold occurs native in the talc schist, and the pyrite and ilmenite are also saved for reduction. The writer's notes make no mention of quartz in this vein.

As stated above, the talc, chlorite and other associated schists form considerable belts in the area of the Bidwell Bar atlas sheet, and contain frequent quartz veins, as may well be seen at Quartz Hill, north of Lumpkin. The writer knows of no case, however, where one of these veins has proved to be large enough and to contain enough gold to warrant the erection of a quartz mill.

The rare occurrence of quartz veins in serpentine, a very basic magnesian rock, and their comparative abundance in talc rocks, which are much more acid, would seem to indicate a connection between quartz veins and the rock in which they form. But as both these rocks are altered forms of deep-seated igneous rocks, it does not follow that the silica of any particular quartz vein was leached out of the wall rock and re-deposited nearly in place. These igneous masses may extend to a great depth and the ascending hot waters and gases may have been in contact with rock like the wall rock for a long distance and for a considerable time.

As a matter of fact, quartz veins are more common in California in sedimentary rocks which are not presumed to extend deep into the earth's crust, than in igneous masses. The cause of this is more probably a physical than a chemical one, for fissures form more readily in sedimentary than in massive igneous rocks. It is extremely likely that the sedimentary series of the gold belt of California is underlain throughout by granite, and that this rock is the chief source of the silica of the quartz veins in the clay slates, and other associated rocks.

Serpentine being a rock in which fissures may be supposed to form with difficulty, it is by no means improbable that there is a physical as well as a chemical reason for the lack of quartz veins in that rock.

Mariposite.—The green micaceous mineral called mariposite by Silliman occurs abundantly at the Josephine mine, near Bear Valley. Several specimens of this were obtained in 1893, and submitted to Prof. F. W. Clarke for analysis. Thin sections of the material were made and these show that the mineral is micaceous, nearly colorless or slightly greenish with brilliant polarizing colors, resembling talc. There appears to be no perceptible pleochroism. The mineral is in the form of fibers and minute irregular foils with ragged edges, and extinguishes nearly or quite parallel to the longer axis of the fibers. Microscopically it is not all green, some of it being nearly white. Two analyses are appended by Dr. Hillebrand, one of the green, and the other of the white mineral.

Analyses of Mariposite. (438 Sierra Nevada Coll.)

	Green.	White.
SiO_2	55.35	56.79
TiO_2	.18	25.29
Al_2O_3	25.62	
Cr_2O_3	.18	none.
Fe_2O_3	.63	1.59
FeO	.92	
CaO	.07	.07
MgO	3.25	3 29
K_2O	9.29	8.92
$(Li\ Na)_2O$*	.12	.17‡
H_2O†	3.52	4.72
	100.13	100.84

* Very strong lithium reaction.
† No water given off below 300 C.
‡ Containing some K_2O.

The thin sections show that there is carbonate, probably chiefly dolomite mixed with the mariposite. This with some carbonate of iron was extracted with acetic acid followed by warm dilute HCl, the mariposite substance remaining unattacked. Dr. Hillebrand calls attention to the resemblance of the mineral in composition to pinite, and states that no definite formula is deducible. He determined the specific gravity of the green mineral to be 2.817 at 29.5° C. and that of the white mineral to be 2.787 at 28.5° C. The occurrence of chromium in the green variety and not in the white suggests that to be the cause of the green color. While resembling talc optically it will be noted that the chemical composition is very different.

Gold Quartz Veins in Tertiary Rocks.—Precious metal deposits in rocks of the tertiary period are not uncommon in the western United States. As notable examples of this may be mentioned the Comstock lode in Nevada in part at least in Tertiary lavas, and the gold and silver veins of the Bodie district in hornblende-andesite.* Silver deposits also occur in rhyolite in southern California.† But in the Sierra Nevada gold quartz veins in any but the Paleozoic or Jura-Trias rocks are rare. The occurrence of quartz with native gold in a rhyolite dike of Tertiary age in Plumas county has already been described.‡ The gold in the Silver Mountain district in Alpine county (Markleeville atlas sheet) is in chalcedonic quartz in Tertiary andesitic tuffs and the deposits of the Monitor district are likewise in Tertiary volcanic rocks. One of the ore specimens given the writer by Judge Arnot as coming from the last district is chalcedonic quartz containing gold. In both districts the rocks containing the deposits are much decomposed by solfataric action, and both are on the east slope of the range in the Great Basin drainage.

About one and a half miles south of La Grange in Stanislaus county (Sonora atlas sheet) in a flat-topped hill there are abundant veins of white quartz in clay which appears at first glance to be the basal portion of the Tertiary clastic series that caps the hill. Overlying the clay is a sandstone containing pebbles of white quartz and pearly scales of a hydrous silicate of alumina, which is very abundant in the Ione sandstone.§ The age of the sandstone is thought to be Miocene. Portions of the underlying clay are white in color, other portions stained pinkish in streaks and patches. When first visited, some years ago, the clay appeared to the writer to represent the lower clay of the Ione formation, which is well exposed at Ione and elsewhere, and as the quartz veins are unquestionably in the clay, it was then thought that the quartz veins were of Tertiary age. The quartz is the white, compact kind that occurs in the majority of the gold quartz veins, and not the chalcedonic quartz known to exist in veins in Tertiary rocks.

On a second visit to the locality, in 1894, good evidence was found that the clay is but the decomposed bedrock, which is here a quartz-porphyrite. Pebbles of the hardened clay were found in the lower part of the sandstone, and along some sharp contacts of the clay and overlying sandstone it was noted that the quartz veins stopped short at this contact. No quartz veins were found with certainty in the sandstone itself. Moreover some cracks in the clay, extending down from its upper surface, were filled with the material of the sandstone, showing that these cracks were in existence when the sandstone was being deposited and were filled in from above. At the head of a little gulch on the west side of the hill is a good exposure of the clay, with numerous quartz veins. The latter have a varying course, dipping mostly north at angles from 10° upward, some veins curving very noticeably in a vertical direction. In some of this much stained and discolored clay, porphyritic quartzes are to be seen, and as lower down in the gulch there is little altered quartz-porphyrite in place, there seems little question that the clay is a decomposed form of the same rock. At other points, notably on the east side of the hill, the white clay shows no evidence of its derivation from the bedrock, being of even texture throughout and without discoloration. Slickensided surfaces were noted in the clay at several points, along seams that intersect at varying angles.

Tetrahedrite.—This sulphide of copper and antimony has not often been noted by the writer in the gold ores of the Sierra Nevada. What appears to be this mineral, however, occurs very abundantly in the quartz veins of Mono Pass, east of the Yosemite Valley. The specimens (No. 455 S. N. collection) collected there by the writer from the Golden Crown ledge were examined by Prof. R. L. Packard, who reported that the sulphide is tetrahedrite or an allied mineral giving blowpipe reactions for sulphur, antimony, copper, lead and iron. The ore is presumed to contain silver and perhaps gold, but neither of these were determined.

Mr. W. Lindgren informs me that he has detected tetrahedrite at the following mines: The Boulder, Hathaway, Golden Stag and Pine Tree mines in the Ophir district in Placer county; the Osborne Hill mine at Grass Valley, Nevada county; and the Miller & Holmes, Knox & Boyle and Whiskey Hill mines in Tuolumne county, azurite being associated with the tetrahedrite in the last three mines.

Tioga Mining District.—This is situated to the northwest of Mono Pass, in the same body of schists that occurs in the Pass. Some specimens obtained there in 1866 by the writer from the Isbell claim, on Lee Vining creek, were assayed by Dr. W. H. Melville, with the following results:

No. 876 Sierra Nevada collection—

(*a*) Chiefly made up of zinc blende; contains 5 oz. gold and 7 oz. silver to the ton.

(*b*) Largely iron and copper pyrites; contains a trace of gold and nearly 16 oz. silver to the ton.

(*c*) Contains a large amount of arsenical pyrite, 51 oz. gold and 32 oz. silver to the ton.

The above samples probably do not represent an average of the ore and are merely given to show the association of minerals in the vein.

* This was first noted by Mr. W. Lindgren.
† W. Lindgren, Trans. Am. Inst. Mng. Eng., February, 1887.
‡ American Journal of Science, vol. xlvii, p. 472.
§ American Geologist, vol. xiii, p. 240.

Keeping Everlastingly At It Brings Success.

Genius is really only the power of making continuous efforts. The line between failure and success is so fine that we scarcely know when we pass it—so fine that we are often on the line and do not know it. How many a man has thrown up his hands at a time when a little more effort, a little more patience would have achieved success. As the tide goes clear out, so it comes clear in. In business sometimes prospects may seem darkest when really they are on the turn. A little more persistence, a little more effort, and what seemed hopeless failure may turn to glorious success. There is no failure except in no longer trying. There is no defeat except from within, no really insurmountable barrier save our own inherent weakness of purpose.

Nature's Hydraulic Mining.

The Sacramento *Record-Union*, now that its associate, the *Bee*, has temporarily withdrawn active opposition to hydraulic mining, is engaged in an attempt to organize the people of the valleys into another crusade against those of the mountain counties.

The real problem of the Sacramento valley, says the El Dorado *Republican*, is not and never will be the discontinuance of hydraulic mining, for the fields that now remain accessible to that class of industry are becoming more and more limited every year, and they will ultimately become exhausted. The principal work of denuding the Sierras by mining has already been accomplished, and when every ravine and canyon in the gold-bearing region of the State was filled with miners, the amount of debris sent into the river systems was ten thousand times greater than it ever can be in the future.

The men and the newspapers that complain of the filling of the Sacramento valley by debris from the mountains are fighting against the law of gravitation and trying to prevent muddy water from running down hill. Ages in the past, as any observer can note in the topography of the Sacramento valley, it was an arm of the sea. Since that time it has been filled and converted into the finest farming lands of the State by the natural wearing down of the hills and mountains above it, the river channels filling in at one point, piling up the debris into a long tongue of sediment and then breaking its way to another depression till the lowest places are brought up to the general level. Thousands and thousands of acres of land in the valley have been filled in by this process and the bills of the mining counties worn down for hundreds of feet and torn into great canyons by these natural forces, unassisted by human effort, and yet the ranchers of the Sacramento valley and the people of the cities of Sacramento and Marysville attempt to shift the responsibility of God or Nature upon a few insignificant miners.

The rancher of the valley secures a piece of boggy land along one of the streams which ordinarily, under natural conditions, would draw from six inches to two feet of water in a wet season; he fences this land with mud levees to keep the stream away that is merely obeying the laws of Nature in trying to fill it, and thereafter he bowls against the miners for destroying his property.

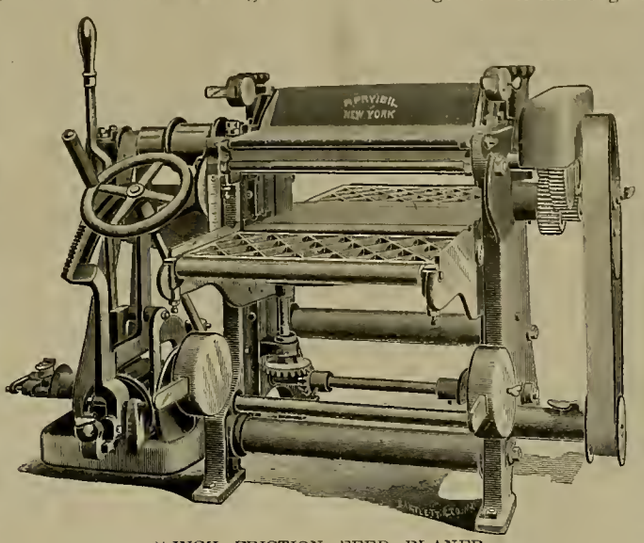
No matter what men and human laws and courts may do in relation to the Sacramento valley, no matter whether mining is continued or discontinued on the slopes of the Sierras, the laws of Nature will continue in force and the extremely low grounds surrounding every stream in the State will ultimately befilled whether men desire that result or not. If every miner in the mountains was driven out of the State and every human being was driven out of the mining counties, the wear and tear of floods would go on in the future as they have in the past, wearing down the hills and filling in the valleys. There is no way in which man can prevent this result, so long as rain continues to fall and rivers to flow. Already the debris sent down from the cultivation of land in the foothills is greater in most counties than the silt from hydraulic mining. Every piece of plowed land washes in spite of all the hill rancher's care, and his best soil is virtually stolen from him by natural agencies and taken to the valleys, to build them into farms for other men. Are these foothill ranchers to be prevented from plowing their ground because this act makes mud that troubles the valley people? Each rancher does only a small damage, but in the aggregate it is far greater than what is inflicted by the miners, for every bit of cultivated soil sends its muddy stream in winter.

There is a broader and a higher conception of the debris question than has yet been reached by the advocates of either of the conflicting interests, and it is that man may assist the powerful forces of Nature, but he cannot operate in direct conflict with them. If the National or the State Government, or both united, can devise plans for diverting debris from the mountains into the tule beds of the valley, so as to complete the natural process, well and good; but if that cannot be done, the people may expect to raise levees higher and higher and to live constantly under greater danger, for, no matter whether mining ceases or not, the debris will continue to come down.

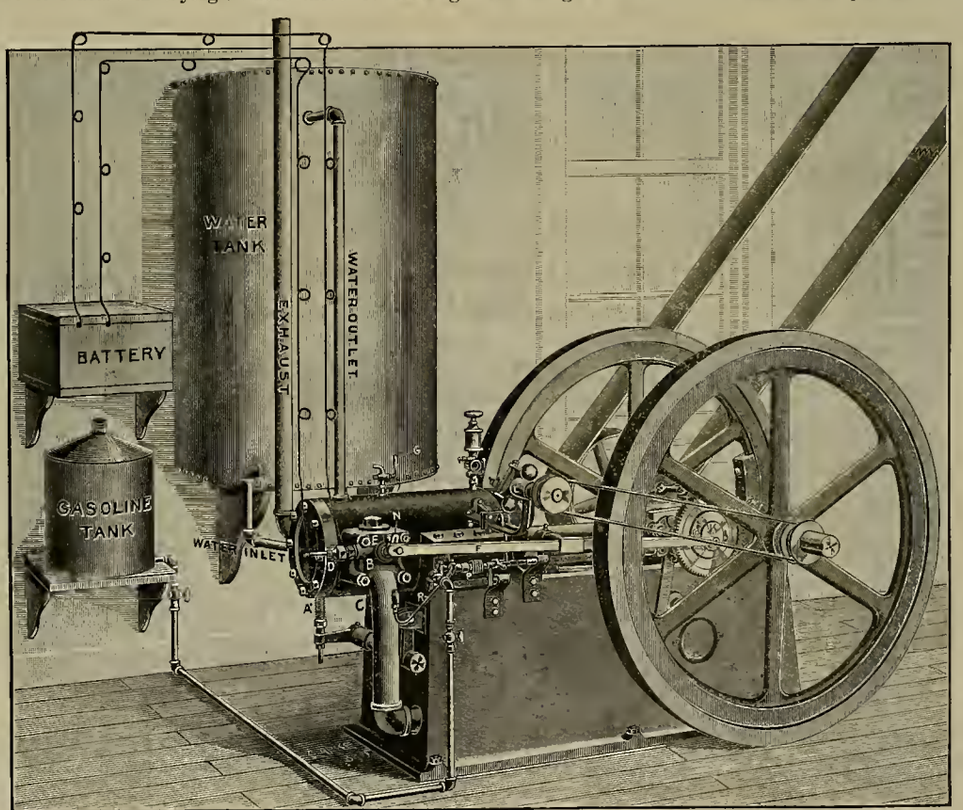
24-Inch Friction Feed Planer.

The accompanying cut portrays a planer with a friction feed, whereby the operator can lessen the feed to one-third of the regular or increase it one-half when common work is to be rushed through the machine.

He can also feed back again in case a larger or smaller cut is wanted. The change can be made instantly without changing belts, and is considered of great value when taking extremely heavy cuts or when planing parquet flooring or any other work where more or less against the grain has to be planed. Floor space, five feet six inches by four feet eight inches.



24-INCH FRICTION FEED PLANER.



THE FOOS GAS AND GASOLINE ENGINE.

The Foos Gas and Gasoline Engine.

The use of gasoline engines as an economical form of power, in situations whose demands are in the range of the capacity of these engines, is constantly increasing. San Francisco manufacturers are producing a superior type of engine and the large number of orders show the favor with which this form of motor is received. The Foos Gas and Gasoline Engine Co., of Springfield, Ohio, also lay claim to many points of merit, and an illustration and description of their engine is of practical interest, the points of similarity and difference being readily recognizable. The charge of gas or gasoline is ignited by a small electric battery. The engine, it is claimed, will run for months without any cleaning or other care than oiling bearings, filling oil cups and seeing that the electric battery is in good working condition.

The illustration presented herewith has the parts lettered as follows: *A*, exhaust pipe, exhaust chamber and exhaust valve; *B*, exploding chamber; *C*, inlet valve in exploding chamber; *D*, stationary electrode; *E*, revolving electrode; *N*, spring crank; *F*, rod which gives revolving motion to electrode *E*; *R*, brass pipe conveying gasoline from pump *P* to mixing pipe *M*; *G*, stop cock for escape of compressed gas; *K*, crank disk for regulating time of explosion of gas in exploding chamber *B*; *L*, governor; *M*, mixing pipe for admission of pure air; *P*, gasoline pump. The motive power is secured by drawing pure air into the pipe *M* and there mixing it with a few drops of gasoline thrown into this pipe by the pump at every other revolution of the fly-wheel. It is thence drawn by the suction of the piston in its outward movement into the cylinder through the exploding chamber *B*. The explosive gas thus formed is compressed by the return movement of the piston and then exploded by an electric spark. The cylinder is surrounded by a water jacket in which soft water is used. Connecting with the exploding chamber is the inlet valve *C*, which is opened and closed at every alternate revolution.

The spark in the exploding chamber is produced by the connection and separation of the inner points of the electrodes *D* and *E*. These points come together at every revolution of *E*. The electrode *D* is made to screw further in, so that when the inside end is worn off it can still be kept in contact with the end of *E*.

The governor *L* is particularly sensitive. If the engine runs too fast the acorn-headed screw at the end of the shaft can be turned in, and if the motion is too slow the screw may be withdrawn. The speed may also be controlled by compressing or loosening the governor springs by means of the nuts at the ends.

Two of the distinctive features of the Foos gas engine are its patented electrodes and governor. They use one revolving and one stationary electrode, the revolving one wiping the point of the stationary electrode. This keeps the points always bright, insuring a good electric spark, permitting the starting of the engine in a few seconds. These electrodes, in connection with the sensitive governor, enable them to furnish an engine that will give a steady, unvarying speed suitable for running electric light plants or any other machinery requiring steady speed.

In his famous speech on conciliation with America, Burke uttered a text which each of us may profitably ponder: "All government, indeed every human benefit and enjoyment, every virtue and every prudent act, is founded on compromise and barter. We balance inconveniences; we give and take; we remit some rights that we may enjoy others." These few lines epitomize all human action. Whatever be our occupations and ambitions, it is impossible to progress with our cherished undertakings until we realize that, of all the necessities of social or industrial life, none is greater than the spirit of mutual compromise.

With steel unprotected and exposed to the action of the weather and sea water, corrosion is said to go on at the rate of 1 inch in 82 years, while with iron the rate is 1 inch in 190 years. Exposed to the weather and fresh water, these periods are increased to 1 inch in 170 years and 1 inch in 630 years, respectively. When kept completely immersed in sea water the rate is said to be 1 inch in 130 years for steel, and 1 inch in 310 years for iron.

Mineral Land in Northern California.

TO THE EDITOR:—The United States Land Department seems to be trying to classify mineral and agricultural lands by the smallest legal subdivision. After critically examining each subdivision, if no paying mines are found it is called agricultural land, whether it can be used as such or not, and this is done in well-known mining sections.

The two kinds of land should be divided in this way: All land suitable for agricultural purposes, whether mineral in character or not, should be classified as agricultural land. All land mineral in character and not suitable for agricultural uses should be classified mineral land, even though it does not show mineral in paying quantities, if situated in a well-known mining region. There is a very small amount of land in California mineral in character, and yet suitable for agricultural purposes.

The labor of a commission one year would classify all the land in California, if done in this way, and with little dissatisfaction except to those who are trying to patent mineral as agricultural land.

To allow this gold-bearing land to be controlled by a monopoly would be a crime scarcely equaled by the demonetization of silver. Prospecting would cease, for no one would care to be subject to arrest for trespass. When prospecting stops gold mining ceases.

In a letter from a high official of the Southern Pacific Railroad Co. to a land agent at Portland, Oregon, he says a reputable citizen, who at one time occupied a position on the bench, forwarded to the land department an affidavit declaring that all land north of Township 32 north in the State of California was mineral land. He said that if the Goverument pay heed to such affidavits large areas of agricultural land would remain in its primitive state. The writer filed that complaint (but never occupied a position on the bench), and it was true, but was dismissed by the Commissioner of the Land Office for the reason that there were non-mineral affidavits on file in this office on the land. There are affidavits on file in the Land Office at Washington that there is no mining land north of Township 32 north in California, and the Commissioner believes them.

The miners of this State would like to know who filed those non-mineral affidavits, but have not yet succeeded in finding out. The writer has made over nine thousand gold and silver assays, and has shipped nearly five hundred thousand dollars' worth of gold ores to smelters from this land since 1886.

While there is not a paying mine in all of the smallest legal subdivisions it is well known mineral land, and not an acre should be patented to the railroad company, except some timber land on the east side of the Sacramento river. This same official says there are mining companies in this State holding under the placer mining laws from one to three thousand acres for the timber only. There is also a railroad company trying to patent over two thousand square miles in Northern California that, by the terms of their land grant, and a decision of the Supreme Court of the United States, and the character of the land, they are not entitled to—not an acre of it. If the land could be examined by a commission, or the miner allowed to prove its character other than by the absurd and impossible way, the smallest legal subdivisions, the railroad would get no patent to this land.

If this is not mineral land under the decision of the Supreme Court, there is none.

One would suppose from this official's letter that a prospector was a marauder that went about the country breaking into private enclosures without let or hindrance, and the best way to suppress him would be to turn the mineral land over to the railroad company. He says he knows of no law that would allow anyone to prospect on company land, which is quite true. It would stop this (as he would have the people believe) enemy of the farmer.

The output of gold and silver for Shasta, Siskiyou and Trinity counties was $2,532,529.78 for 1893. The output of these counties is increasing, and will continue to do so, unless the Government patents the odd sections to the railroad company. An examination of this land will show that there are not forty acres in one body of agricultural land not already taken. The little there is has almost all been patented years ago. But if there must be a paying mine on every twenty acres, on odd sections, before the miner can hold it, it certainly was not the intent of Congress to exempt mineral land to the extent of twenty acres only for each paying mine. There are many townships that were advertised for patent by the Redding land office where "one might as well look for birds in the sea or fish in the air" as to look for agricultural land. It appears to be a scheme of the United States land department and the railroad company to compel a miner to prospect his land judicially, and in small quantities at a time. This, no doubt, will be as expensive as running tunnels or sinking shafts, but hardly so effective.

To prove the existence of soil suitable for farming on top is more easily done than to prove the existence of mineral below the surface. The agricultural character of the land is entirely ignored in this judicial prospecting, and the miner is called upon to prove an impossibility, namely, mineral in paying quantities in each and every one of the smallest legal subdivisions. To compel a miner to contend against an imaginary agricultural value when none exists is neither law nor common sense. J. E. BELL.

Shasta, Cal., May 28th, 1895.

Cripple Creek's Fine Native Gold.

TO THE EDITOR:—In your issue of April 20th there was an article copied from the Grass Valley *Tidings* of April 10th, stating that there had been 6.37 ounces of gold dug from the ground near Rough and Ready, which had been sent to the mint at San Francisco in the form of amalgamated cakes and showing a fineness of 992¼, and that the report showed the entire absence of silver, a circumstance so rare as to deserve prominent mention, and that it was believed that the Rough and Ready could go on record as a producer of the purest gold dug from the ground.

I wish to state, and I believe that you are ready to receive all such information for publication in your valuable journal, that through the courtesy of the U. S. mint officials of this city, William J. Puckett, assayer in charge, I have been permitted to examine the books and I find therein that upon March 14, 1893, there was deposited 134 oz. of gold from Cripple Creek, Colorado, that went 999 fine; no silver. May 11, 1893, 48 oz., 999 fine; June 19, 6 oz., August 29, 17 oz., March 5, 1894, 19 oz., 999 fine; different depositors. And, besides these, I find that on August 15, 29 oz. showed a fineness of 996; no silver. September 5, 30 oz., 996 fine; no silver. November 1, 3 oz., 997 fine; January 20, 1894, 5 oz., 997 fine; February 9, 1894, 7 oz., 997 fine, and March 19, 19 oz, 996 fine. I also find recorded therein seven other entries, all deposits made from Cripple Creek, ranging from 993¼ to 995½ in fineness—from March 1, 1893, to March 1, 1894. All these deposits were from the Cripple Creek gold camp, El Paso county, Colorado. The names of the depositors are to be found upon the hooks of the United States mint and are withheld from mention in this article at the request of the mint officials.

Cripple Creek is on record as the producer of the finest native gold in the world. The most of this gold that is found so fine in nature is in the form of cubes, and I believe very rare. I have in my office some specimens of same gold which will be on exhibition at the Mining and Industrial Exhibition to be held in this city in 1896. The placer gold of Cripple Creek is worth $20 an ounce, upon an average. The placer gold of Park county, Colorado, in the Tarryall district, is worth, upon an average, $19.90 an ounce. Respectfully yours, THOMAS B. EVERETT.

Denver, Colo., May 22, 1895.

South African American Exhibition.

Under date of April 4th, I. F. Webner writes from Cape Town, South Africa, as follows:

"Several South African merchants, American and otherwise, together with our local consul, have discussed the idea of an American exhibition to be held in South Africa during November, 1896 (our spring, your fall), at some city to be subsequently decided upon. The enormous strides made by this country during the last few years have been most remarkable, and such a scheme, if properly worked out, would form an unrivalled advertisement which would be noticed by the whole of South Africa, and not confined to any one place; and as this is pre-eminently the land of the future, it is well worthy of your attention. On behalf of the Provisional Committee, I should be pleased to supply you with any statistics or information generally as to the country's resources and trade, and arrangements would be made for a special low freight rate.

"Before submitting a draft prospectus, the feeling of manufacturers and merchants in America towards such a project is being tested, and I trust to hear favorably from you."

The secretary's address is Box 429, Cape Town, S. A. The matter is worthy of local attention.

Where Wampum Is Still Used.

"A small part of the commerce of the world is still carried on by the use of shells as a medium of exchange," says E. G. Woodcraft, a New York broker. "The Portuguese found this sort of money in use by the natives of the eastern coast of Africa when they opened up trade in that region, and have found it to their advantage to continue the practice. Fortunes are said to have been made by collecting the shells on one part of the African coast and putting them in circulation at a point only a few hundred miles away. These shells are sold by weight. The price varies according as the supply compares with the demand. Prices have been known to double and even treble within a few months. The prices also vary greatly within short distances. What has cost the merchant from 50 cents to $1 in the market, will often bring him $7 or $8 worth of goods in another market."

Coast Industrial Notes.

—The new $60,000 crane at Mare Island has been satisfactorily tested.

—Oregon expects to sell 100,000 bales of hops this year. Last year's crop was 65,000 bales.

—W. E. Henry has sued the city of Sacramento to recover $563,285 for alleged violation of a contract to supply the city with clear water.

—A separate receiver has been appointed for the Colorado Midland railway, although its capital stock is owned by the Atchison, Topeka & Santa Fe.

—The Amoor River Co., of Siberia, are having built twenty-two 500-ton steel barges. Half the number have been contracted for at the Union Iron Works.

—The Panama R. R. Co. has a contract with four additional steamers to ply between Panama and San Francisco, stopping regularly at Mexican and Central American ports.

—J. Van Buskirk, of Michigan, has bought 20,000 acres of sugar pine in Calaveras Co., and has a force of men clearing out the Mokelumne to float the logs to a point where they will be sawed.

—The Girard Water Wheel Company is building a 200-horse power plant for the Light and Power Company of Ontario, Cal., and has shipped a 20 H. P. plant to the North Star Mining Company, Grass Valley.

—Nearly $100,000 will be expended this summer by the Market Street Railway Co. of this city in the improvement and extension of the Ellis and O'Farrell street electric lines, including twenty-four new cars, costing $72,000.

—An Anglo-Canadian syndicate is about to purchase a number of wooden sailing vessels in England, with a view to establish in British Columbia and along Puget sound a local lumber fleet. The vessels will be of moderate size, ranging from 600 to 1000 tons register.

—Boise City, Idaho, reports that the long-talked-of railroad from Butte, Mont., to Reno, via Boise City, will soon be built. H. H. Daniels, representing Philadelphia and New York capitalists, is making final arrangements. The business men of Boise City will put up the required $100,000 bonus.

—The Santa Fe & Cochiti R. R. Co. has incorporated to build a railway from Santa Fe, N. M., along the Santa Fe river to Agua Fria, and thence via Allerton and Bland to Rio Grande. Capital stock, $250,000; incorporators, A. H. Handlan, T. M. Murray, L. Ellis, J. H. Purdy and H Claussen.

—The McCormick Mower and Reaper Company, of Chicago, and Enrique Creel, of Chihuahua, have been granted a concession for the construction of a railroad from Chihuahua to the Ocampo mining district. The Government will give a cash subsidy of $8000 per mile. Preliminary surveys have been made.

—By a cut-off from Wenatchee to Cle-Elum the Great Northern can utilize the Stampede tunnel and save building its own $3,000,000 affair. The Tacoma *Ledger* thinks that this is "something Mr. Hill seems to have had in contemplation for some time past, as it is now reported that he has acquired considerable interests in the Roslyn coal deposits.

—J. J. Hill, of the Great Northern, emphatically says: "The Northern Pacific will be reorganized by its bondholders. This is a big job, and will undoubtedly take some time. It cannot be done in a hurry. When it is reorganized it will be handled by its shareholders, and you can depend upon it that there will be no consolidation with the Great Northern—never."

—About $3,000,000 is invested in Alaska salmon canneries, which put up $2,000,000 worth of canned salmon annually. The same destructive measures that so nearly exterminated the Columbia river salmon threaten to gouge the eyes out of the Alaska business also. The Government should stop the Alaska salmon slaughter at least, even if unable to stop the rapid extermination of the seal.

—Two daily newspapers have put in type-setting machines, which bear the same relation to setting type by hand that a header wagon does to a scythe. The latest achievement in swift newspaper work is to dispense entirely with the type-setter, the type-writing machine, and manuscript or "copy," and set the news direct from the wire or telephone with the linotype, which has a capacity of thirty words per minute.

—The directors of the S. F. & S. J. V. R. R. have finally secured satisfactory settlement of the China Basin lease with the city Harbor Commissioners. At last Tuesday's meeting the whole matter was formally arranged. A contract for 300,000 redwood ties was made with L. E. White & Co. at twenty-eight cents each. There were thirty-five bids, the highest bids being 47¾ cents for Port Orford pine and 40 cents for redwood. The entire amount must be furnished by May 1st, '96.

—H. P. Wood, the Hawaiian consul at San Diego, received an order from the commissioner of agriculture and forestry of Hawaii for 500 horned toads, to be used on the islands to destroy a bug that is eating everything in sight. The commissioner wrote that a lot of toads had been imported, but that they required water, which was not always handy, while the horned toad needs no water and is equally expert as a bug catcher. Consul Wood has advertised for horned toads, offering to pay $1 a dozen for them.

—Judge Goodwin, in the Salt Lake *Tribune*, says: "San Diego wants railroad connection with Salt Lake; so does Los Angeles; so, we believe, does Santa Barbara; so, we know, does San Francisco. If one of either of five men whom we know in this city had the nerve to use a little of his own money and to go East, he could secure the sale of bonds enough at $15,000 per mile to build the road. He could build the road for $12,000 per mile, and with it finished he could own the road, all the stock of the road, and have $200,000 in his pocket, and he could in five years pay off all the indebtedness and then own in his own right a property which would be worth at least $25,000,000. At the same time he could double all his property interests in Salt Lake City. It may be asked how we know this, and our answer is, because the freight on the coal alone for the Southern Pacific, the Atchison, Topeka & Santa Fe and the city of Los Angeles would pay all the operating expenses and fixed charges of the road, leaving the freight on ores, the merchandise freight, the passenger freight, the mails and express clear profit. We said five years to clear up the debt. We believe it would not require over three, and the only very moderate charges need be made to do that. The writer of this once showed how, at one-half the rates charged by the stage companies and express and freight companies, a road between Eureka, Nev., and Palisade would pay for itself, all the money back, in two and one-half years. The first million expended in building the road was thrown away, but when the road was finally put through all the money and all the interest was paid back in fifteen months. The road between here and Los Angeles would be a good speculation if there were no mines on the way, just the coal to carry out, and the passenger trade would be enough to pay the interest on the cost and large dividends. But when we consider the number of mines that would have to be supplied, and the amount of ore that would have to be moved, it makes the building of that road the very finest investment that can be found in the West."

Scientific Progress.

Argon.

It is the general opinion that Lord Rayleigh will get the $10,000 prize offered by the Smithsonian Institution from the fund given in 1891 to that institution by Thomas G. Hodgkins of New York, to be devoted "to the increase and diffusion of more exact knowledge in regard to the nature and properties of atmospheric air, in connection with the welfare of man."

Argon has a name, given by its discoverer, which means "no work." It can't be made, by the utmost ingenuity of the chemical manipulators, to do anything. They have tried every conceivable means of making it give some sign of stir, motion, or potential energy, but without avail. There is but little of it; it is good for nothing, a mere tramp element, or perhaps compound, for nobody can find out what it is, not even to make a good guess; and all the noise about the discovery is due to the fine work done in getting to know the naked fact of its existence, and, so far, its uselessness and worthlessness. The fine work, however, has been exaggerated. It was made comparatively easy by starting from the very plain fact that nitrogen in the air is heavier than nitrogen obtained chemically. It was easy to argue that there must be a little of something else of greater weight in the nitrogen of the air. On this sure basis some very fine work was done, simple enough in theory, along either of two lines, and not so difficult. The stuff is so inert, inactive, so thoroughly dead in all its relations that measures for making the true nitrogen unite with anything will give the false as a residue. The difficulties are thus easy difficulties, and creditable as the work may be it cuts no figure at all by the side of the real great discoveries made by Faraday when he held the position at the Royal Institution in London which Tyndall held after him, and which Lord Rayleigh now holds. The enthusiasm over the discovery is for the most part a generous compliment to men of very great distinction who have conducted the research. And the suggestion of letting the Hodgkins fund prize of $10,000 go to Lord Rayleigh cannot be acted upon except by wrong of the most manifest character. "In connection with the welfare of man" is the broad fundamental condition of the fund, and argon has no more met that condition than a study of the man in the moon would meet it. The use of a single dollar of the Hodgkins money on account of Lord Rayleigh's interesting but absolutely valueless research would be as much a wrong to the fund as the use of it in aid of Secretary Langley's extremely interesting and brilliant, perhaps even hopeful, flying-machine experiments. In one of the elaborate treatises sent in upon the offer of the Hodgkins prize, it is very fully shown how ignorantly chemistry has misunderstood the character of nitrogen, because of its occurrence in such explosives as nitro-glycerine, when the fact is that the part played by the nitrogen is that of its inertness, its feeble chemical hold on the oxygen, to the energy of which, and to that alone, the violence of the explosive is due. In the light of correct knowledge of nitrogen by far the best guess that can be made in regard to argon is that it is three-atom oxygen: not made in the laboratory of our atmosphere, perhaps, but the heir of the ages of cosmic fire, when were finished some things which defy the meddling hand of man.

Mr. Edison has said of argon, that its discovery is a fresh evidence of how little we know of the atmosphere, and that he thinks it probable that further experiments will disclose other new elements in the air. But it must be remembered that argon, the amount of which in the air is estimated to be a hundred and twentieth part of the whole, has gone along with nitrogen, as ozone with oxygen; and that mere discovery of the existence of minor elements that play no active part amounts to very little. The new knowledge needed is knowledge of the parts played by the known elements.

When a rifle gun comes from the arsenal, it is coated with grease to prevent rusting during transit, and this coating is kept on until the gun has been lifted into its carriage. The grease is then removed by washing the gun with a strong solution of potash. It is washed twice and allowed to dry thoroughly. The gun is then a glistening silver tube. The next operation, and one requiring more care, is the application of a mixture of sulphate of copper dissolved in sweet spirits of niter. To an ounce of each is added a pint of distilled water. Four coats of this are applied, rubbed down hard, and allowed to dry for twenty-four hours. Under this treatment the gun is transformed into a warm reddish-brown without gloss. By adding arsenic to the same solution, and applying again, the gun assumes a darker tone. Now comes the hardest part of the work—the polishing. Boiled oil is mixed with beeswax and turpentine until comparatively thick. This is rubbed in with cotton rags at first, and then with the palm of the hand, the result being a mahogany brown tint. The brown coat lasts remarkably well unless the gun be fired, when the heat of the discharge seriously damages the polish. The last coat is replenished about every month. There is also a process of treatment given to the gun carriages of the new crack cruisers. These carriages are cast, and it is a difficult matter to make white paint adhere to them. To obviate this, the carriages are covered with a thin layer of cement, which is polished with trowels until it is like glass, and the white paint is then applied to the smooth surface.

Indefinite penetration toward the center of the earth is prevented by the increasing heat encountered, but a scheme has been made public by which it may be possible to explore farther than hitherto. The method is to sink first a shaft as far as the temperature will permit, then a pipe reaching from top to bottom is built in, down which is forced a blast of cold air which, it is thought, will effect the requisite cooling if continued for some time. The pipe is lengthened piece by piece as the deepening proceeds. An exhaust pipe should also be provided, and the shaft walls, when not air tight, should be so made so by a sheathing of metal plates or other coating. As the shaft is made deeper the heat increases and consequently a stronger blast is required. At a certain depth air must be pumped from the bottom in order to render the pressure endurable to men. In spite of all these precautions the deepening will be finally prevented by conditions existing in the earth itself; for example, accumulations of gases.—Deutsch Bauztg.

The weight of one hundred cubic feet of natural gas is 4287 pounds, composed of 1072 pounds of hydrogen and 3215 pounds of carbon, and requires for its perfect combustion 969.3 cubic feet of air, weighing 74,561 pounds. It makes, in burning, 9648 pounds of steam and 11,788 pounds of carbonic acid, equal to one hundred, and produces 94,593 heat units when the steam is not condensed, the total products of combustion being, therefore: Steam, 9648 pounds; carbonic acid, 11,788; nitrogen, 57,412; or a total of 78,848 pounds. If these products of combustion escape at a temperature of 600°, they carry off with them 12,712 heat units, or about 14% of all the heat produced by the fire; or if they escape at 300°, they carry off less than 7%. If, however, for any reason, twice as much air as is necessary to combustion passes through the fire and escapes up the chimney along with these products of combustion, there would then, at a temperature of 600°, be a loss of heat units equal to about 26% of all the heat produced by the fire.

The most probable mean density of the earth is 5.66, that is, the earth has 5 66 times the mass of an equal volume of water.

Mechanical Progress.

Some Unnecessary Objections.

In discussing the papers upon electric transmission of power that were recently read at a meeting of cotton manufacturers, some of the points brought out in objection to this method seem trivial. One was the fear of lightning and its effect upon the system. The manner in which this was stated would lead to the presumption that dealing with electricity was something new and untried. This matter of lightning is just as serious in the running of a large street-railway or street-lighting plant as in running a mill, yet it appears to have been very satisfactorily settled for those purposes. Objections to the use of electricity must be based upon better grounds than that.

Another objection suggested was that the life of the motors and generators would be very short, and the depreciation and renewals account, therefore, very large. There is really nothing about a motor or generator that is complicated, or which will give out quickly with proper care any more than there is with an engine. One frequently hears of motors giving out at some point, short circuiting or burning out the armature, and likewise we hear of engine piston heads being blown out, of pistons cracking, of crosshead straps breaking and wrecking the engine. Yet no one would have the temerity to suggest that because of this we should abandon the use of the steam engine. Nor should occasional breakdowns be advanced as a reason why motors should not be used. As now made, motors and generators are long-lived, and with proper care will last as long as any other machine. The trouble heretofore has been that the machines have given the impression of an ability to take care of themselves, and are allowed to do so, and trouble results, or the other extreme is tried and ignorant handling has produced a similar result. With intelligent care, motors or generators need not be expensive.

Steam Pipes for Ocean Vessels.

Copper is the material usually employed for making the big pipes which conduct steam from boiler to engine on steamships. By reason of its ductility that metal is admirably adapted to the necessary, though slight, changes in shape resulting from heating and vibration. But with the higher pressures now carried greater thickness is required. Hence a copper steampipe must lose the advantage of bending readily, and its strength will become more uncertain. The customary method of manufacture is to cut up sheets into strips and braze or solder the edges. But the difficulties of making a tight join increase with the thickness of the material, consequently there is now a tendency among marine engineers toward the substitution of iron or steel for copper in this part of a vessel's fittings, especially since it is now considered doubtful whether the last-mentioned metal is, as was formerly supposed, less liable to corrosion than the others.

There is some diversity of opinion, however, as to the best material to use in place of copper. Bends and tees for joints can more readily be made in cast iron than in wrought iron or steel, but the former is much heavier than either of the latter in proportion to their strength. Iron and steel can be drawn out into seamless pipes, but to this process is offered the objection that an undiscoverable flaw in the ingot may develop weakness in the product, whereas copper sheets, such as are used for steam pipes, may be examined for defects on both surfaces. Lap-welded pipes are now made of both iron and steel. Some claim that the latter are much the strongest, and present data to corroborate their assertions. To be sure, lap-welded steel pipes often have a butt-strap riveted along over the weld, as if less confidence were felt in the security of the joint than in that of an iron pipe of the same construction. It is intimated, however, that not only is this precaution needless, but that it actually weakens the pipe. In a recent discussion by experts of a paper read before the Institution of Naval Architects of Great Britain, the preponderance of opinion appeared to be in favor of using steel.

Keep on the Right Track.

To the machinist laboring industriously all day at the bench, the engineer wielding the shovel or sitting in his cab Argus-like looking for signals, and the general mechanic going about his usually arduous duties, it is a potent cause of discontent to see men of kindred origin suddenly rise to wealth and apparent honor by some master stroke, or a succession of such strokes. The career of the mouse-trap peddler and tanner has an evil influence. It is seen that he succeeded by his genius for plunder, his ruthless wrecking of interests entrusted to him and his perfidy in every instance where he could gain by such a course. There are in America a great many parallel examples, only less conspicuous and notorious. The fact that these men generally escape punishment and appear to have been very smart in defying the statutes and the unwritten laws of every-day honor is a powerful incentive to emulate them.

But we do not believe, says the *Scientific Machinist*, that any kind of success dishonorably won proves to be a real satisfaction. How much grander, how much safer to emulate the industry, the courage, the unswerving integrity which enabled our noted engineers and inventors to make for themselves a great name and to confer lasting benefits upon society. No man should be seduced from the path of prudence and rectitude by the sharks who have become enriched without giving value received, who have torn down and deprived, not built up nor caused increment of good to any.

How Steam Pipes Start Fires.

Neither ordinary live steam nor "superheated" steam will heat a pipe thick and strong enough to convey it to a degree sufficient to produce a fire on wood, however dry. It will not even set charcoal aglow or in a blaze. But dry charcoal, when the heat is removed from it, being nearly pure carbon, will absorb oxygen from the air under favorable conditions so rapidly as to produce active combustion—that is, a glow or a blaze. The process of the origin of a fire from a steam pipe is: The heat from a steam pipe will, in course of time, char, or, as the chemists say, carbonize, wood in contact or close to it. When this charring process extends to any depth in the wood it presents a surface full of fissures and cracks, thus exposing a large section to the air. This process of charring drives the oxygen out of the charred portion, and keeps it out while the heat is kept up. When the heat is removed the charcoal reabsorbs oxygen from the air, and if the action is rapid enough in a dry atmosphere combustion is the result. This explains why fires in steam plants and buildings heated by steam, that originated from steam pipes, always occur after the pipes have cooled, generally during the night.

Interest in vertical engines for large powers seems to be attracting considerable attention. The use of vertical engines for stationary work is very common in England and the continent, not because of any very intrinsic merits of the design over the horizontal type, but because of the influence of marine practice upon English stationary practice. In England there are so many large and powerful builders of marine engines that in some manner the influence of their work dominates the efforts of others in the marine line, and when one of these builders makes an engine for stationary work, it is almost always, and quite naturally, very nearly the marine type.

Electrical Progress.

The Electric Locomotive in Railroading.

In the opinion of many experts, the time when the electric locomotive will take the place of the steam locomotive for all kinds of railroad work is much nearer than has generally heen imagined. In support of this helief William Baxter, Jr., points out that no engineer of any prominence would have veutured to say, three or four years ago, that at the present time the electric motor would he making such inroads into the legitimate field of the steam locomotive as it really is making to-day. Mr. Baxter maintains that the ahility of electricity to compete with steam has always heen underestimated. The main reason for this is that ahout the only direction in which competition was considered possihle was in the matter of coal consumption, whereas "railroad men, whether engaged in operating steam or electric roads, know that the coal hill is only one of the items in the cost of operation, and that it does not constitute such a large portion of the total expenditure as to make it possihle for even a very great reduction in this direction to determine the superiority of one system over the other." Mr. Baxter summarizes the principal advantages of the electric motor as follows: First, The cost of repairs is less with electric than with steam locomotives. The mechanism is far more simple; there are not so many moving parts, and these parts are not so much exposed to the action of mud, sand, water, etc. In the second place, the miles run per day, or in other words, the hours of service ohtained per day, are less with steam than with electric traction. Consequently the cost of labor per mile run is much greater and the amount of work done with a given sum invested in locomotives is less than with motors. Locomotives running at an average speed of thirty or forty miles an hour do not make any more miles per day than motor cars, which only average ahout one third these speeds. The reason that locomotives cannot he run as many hours as motors is their limitations of wear and tear. They cannot stand coutinuously the rough and tumble treatment that motors are suhjected to, and they have to he run into the round-house and he thoroughly examined and cleaned up for the next day's run. The importance of the hearing of this fact is evident. When electric motors of larger size and for higher speed come, as they inevitably will, to take the place of locomotives, they will he run approximately the same number of hours as the motors now in use, and will therefore cover from two and a half to three times the distance now covered hy locomotives. The third fundamental advantage of electric traction in this competition is that the motors used to draw a train can he placed under one of the cars. This will reduce the weight of the train, and therefore the power required to move it. The motor car could he made much lighter than the locomotive at present used, and this would give a further saving in power. Less weight would he carried on any one pair of wheels, and the weight would he more thoroughly spring-supported. This would materially reduce the strain on the track, and consequently the cost of maintenance.

Electricity, of New York, which does not devote all its space to censorship of the General Electric Co., says that to have one's hair singed off hy electricity is the latest development of the tousorial art. The apparatus to perform this operation consists simply of a platinum wire stretched over a comb. By pressing a hutton in the handle of the comb current is applied to the wire, and it is heated to a white heat. The comb is passed through the hair, and as the wire comes in contact with the hair it is hurned off, the end of each hair heing cauterized as cut, which process prevents the loss of the oily substance with which the hair is filled. The apparatus is connected hy flexihle cord and attachment plug to a lamp socket, and can he used hy any harher of ordinary skill. A New York electric company manufacture the device.

Combined Electric Lighting Station and Waterworks.

An ingenious comhination of an electric lighting station and city waterworks is oprating successfully in a small German town. Dnring the day, when the consumption of water is greatest, the station accumulators are charged and the water supply is worked hy the steam pump. When the accumulators are charged, and in the morning, hefore the hoilers are heated up, the electrically-driven pump is worked from the accumulators, in case of a large demand for water. In the evening, when the lamps are turned on, the current is taken direct from the dynamo, and at 11 o'clock, when the street arc lamps are cut out, whatever further supply of current is necessary is taken from the accumulators. If a fire should occur in the night, a full supply of water is instantly availahle. On the sounding of the alarm, the attendant at the station starts the electric pump and one compressor. The perfect success of this plan has heen proved on several occasions, and the inhahitants of the little town are proud of their compact and efficient plant, which gives them good and cheap lighting, good drinking water, and a sufficieut supply of water for all purposes of fire extinction. The station is operated at a very low cost, but hy employing automatic current regulators, automatic oiling apparatus on all the moving parts of the steam engine, and hy using ring oiling devices on dynamos and motors, the working of the plant is to he so simplified that one engine driver and a stoker can look after the whole installation, even when some proposed extensions are completed.

Popular Electrical Theories.

A history of popular misconceptions on electrical subjects would make entertaining reading. The superintendent of a Kansas electric light station tells that among a thousand puzzling inquiries that were addressed to him on the night that the electric light was started in his city, was the poser: "Where is the hole in the wire that the juice comes through?" An electrical supply firm in Nova Scotia has lately received the following letter from a Cape Brenton correspondent: "Will you kindly let me know all particulars ahout the incandescent lamps which you advertised in the *Recorder?* That is, what is used in them, is it kerosene oil, etc., or, if not, what is it? And can the material he easily ohtained? Also let me know if the light from your lamps is much superior to the ordinary kerosene ones. I am desirous of getting one or more of them, and would like to know all ahout them." A well known London weekly paper gravely puhlishes amoug its hits of electrical information the announcement that: "A German electrician recently hived a swarm of hees hy the use of electricity. He passed a powerful current through the hough of a tree on which they clustered and the stock causcd them to fall stupefied to the grouud. Before they had time to recover he had them collected and placed in a new hive." An inventive genius, who hails from Columhus, O., has discovered that "if two dissimilar conductors of electricty which are suhject to slight atomic change under the influence of sound are joined together after the manner of a pair of thermopile hars, and the open ends are insulated hy a suitahle nonconductor of hoth sound and electricity a current is generated when sounds are made in the vicinity of the exposed ends. If two or more such elements are connected together we have an acoustic battery, and hy increasing the number of elements it is possible to operate an ordinary call hell by simply clapping the hands in front of the exposed ends of the hattery." This sounds impressive. The way in which the inventor proposes to turn his inspired idea to account is to establish an electrical perpetual motion and among other things to wind clocks by the noise of their own pendulums and light shops hy the noise of the machinery. A contemporary says: "By this scheme also an auctioneer may yet run an electrical cash system with the sound of his own voice; some janitor by the force of his profanity may story up electricity enough to ring a church hell; policemen in noisy hoots could furnish street lights; the mooing cows may furnish power to cut their own fodder; and a harking dog may keep au electric light hurning by and hy on the lawn."

THE report of the General Electric Company for the year ending January 1, just puhlished. shows: Gross earnings, $13,336,611; operating expenses, $11,451,864; net profits, $1,811,747; against $3,189,884 the preceding year; halance, $1,347,164; depreciation, $933,521; surplus, $413,643. This declares seven per cent dividend on the preferred stock, or $297,640 per annum, leaving for the common stock in the year 3.44 per cent. The report states that as a result of the Ball decisions there will be less profit than formerly in the lamp business, and that of the decrease in hills and accounts receivahle there was written off $2,291,844, accounts due hy 466 persons. The estimated value of the company's patents is unchanged.

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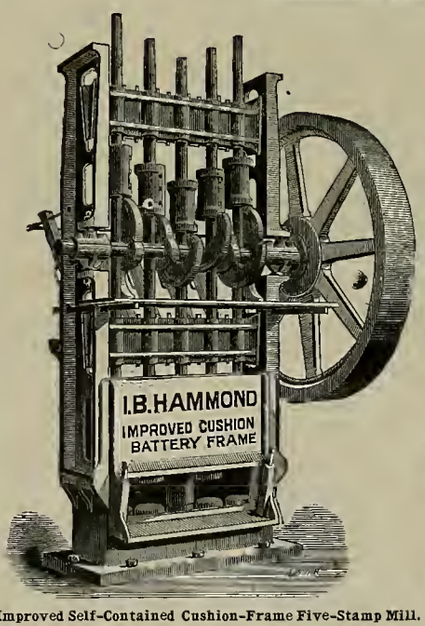

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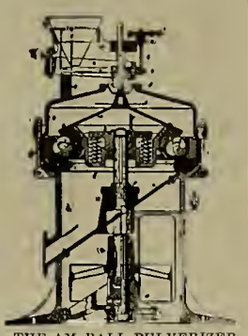

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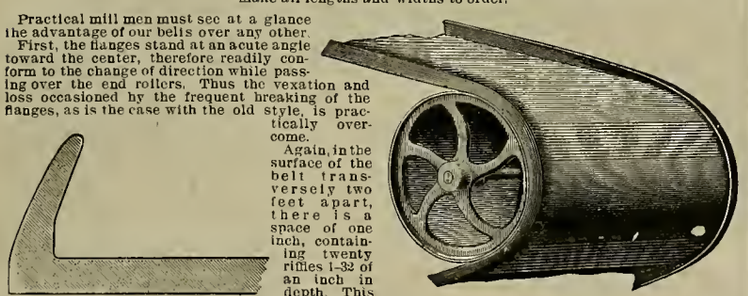

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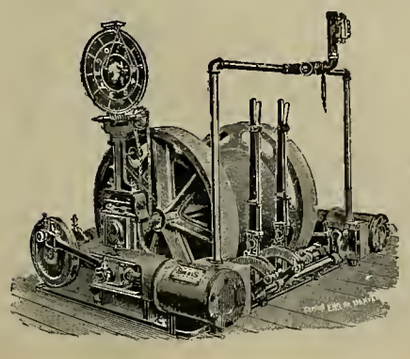

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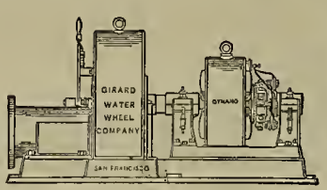

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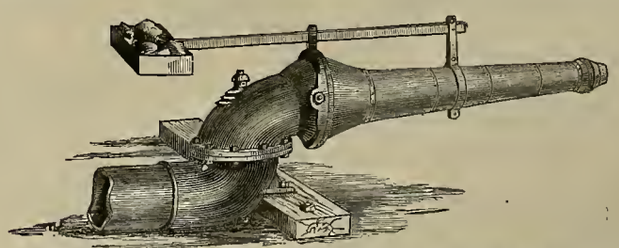

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GENERAL NOTES.—An installmeut of the wages due the miuers of the Mayflower and original Amador mines has been paid. The men have not resumed work.

The Keystone Company, owing to the disaster of the fire and the expense of rebuilding the mill, have run behind with their payments, but it is believed that the yield of the mill is sufficient to enable them to gradually wipe out the indebtedness. They were five months behind some time ago; now they are only two months in arrears. In a short time they expect to be eveu.

John Allisoo, owner of the Allison quartz mine, near Plymouth, has sold a one-half interest in the property to Messrs. Garrity and others of Stockton, the purchasers assuming a mortgage debt upon the mine of $2000.

The Bay State mine, near Enterprise, is reported bonded to Johu English for the sum of $161,000, payable in six months.

JACKSON DISTRICT.—S. W. Bright has returned from this city where he was in consultation with the people who are preparing to work this mine. Their attorney has passed favorably upon the title to the properties and now it is supposed the purchaser's representatives will get to work in a short time.

The new reservoirs at the Kennedy are uow being utilized.

The Argonaut is down 720 feet, the last forty of which was in black slate. The machinery will all bo in running order in a few weeks.

SUTTER DISTRICT.—Supt. Parks tells the *Ledger* that within the year the South Eureka will have a mill. The contractors are at work driviug south at the 1050 level, toward the ore bodies which were developed at the 900 level. This work is being done at $3.48 per foot. They have made a uew ore dump recently from which their wagous were to be loaded to haul to the mill, and have also put a uew No. 5 blower iu to supply air to the lower levels.

AMADOR DISTRICT.—The Keystoue company is contemplating the construction of a chlorination works with capacity sufficient to handle sulphurets from their own mill.

DRYTOWN DISTRICT.—The sulphurets works at Drytown was started up last week and will run for the season.

SUTTER CREEK DISTRICT.—Tweuty stamps of the Mahoney mill have beeu put in first class condition and ten are dropping. The other ten will he started up when the conceutrator and plates arrive.

El Dorado.

PLACER CLAIM SOLD.—*Republican*: Messrs. Finch, Stevens and McKinney have sold their placer miuing claim, 80 acres, to parties connected with the Grand Victory mine. There is believed to be running through this tract of mineral land a large vein of ore that, when developed, will be of immense value.

THE BLUE GOUGE.—The Blue Gouge quartz mine, on Camp creek, has been sold to English capitalists. It is the intention to have a 60-stamp mill running by the first of September and to have chlorination works constructed on the ground ready for use before winter begins.

Inyo.

THE HIRSH MINE.—*Register*: Mr. Geo. T. Rives, who will superintend operations for the Eastern company which recently purchased the Hirsch mine, arrived last Friday evening, accompauied by Mr. J. D. Bancroft of Chicago, one of the parties interested. With them came Surveyor S. P. McKnight, who is now engaged in making surveys of ditch to utilize the water power of the Inyo canal, a mill site and tramway from mine to mill. A ten or fifteen stamp mill will be put up as speedily as material and machinery cau be procured, also required buildings at mine and mill. The tramway will probably be a little more than a mile in length. A few men will he put to work in the mine at once, and it is hoped to have the stamps dropping within ninety days.

Mariposa.

A LONG TUNNEL.—The Mariposa Grant Company now purposes the construction of a long tunnel at Shepherd's Point above Benton Mills, to tap the Pine Tree and Josephine mines, the completion of which will greatly facilitate operations in the future on both veins and give them command of all the lower levels.

Mono.

A BIG SUIT.—*Chronicle-Union*: On Weduesday a complaint in trespass for $283,000 damages was filed in the Superior Court by the Standard Con. Mining Company, plaintiff, against the Bodie Con. Miniug Company. The plaintiff alleges that the defendant entered its mining claim, called the West Bullion, hy means of underground tunnels and workings, as early as 1884, and since said time has repeatedly extracted and converted to its use ores, belonging to plaintiff, from the ledges known as the Burgess and Second South Ledge. The complaint alleges that plaintiff did not discover said facts and trespasses until 1894. The miuing ground is situated in Bodie, and the plaintiff and defendant are the two leading companies of the Bodie district.

Nevada.

FEDERAL LOAN.—A five-foot quartz ledge carrying free gold is reported in the Federal Loan mine.

THE ENGLISH MOUNTAIN.—*Tidings*: A new pump for the Euglish Mountain mine was loaded at Nevada City, Thursday, and started for the mine. The mine will start in a very short time, with Chris Mallon as superintendent.

THE FORTUNA.—The water has been pumped out of the Fortuna mine, and a crew of men has beeu put to work. Two shifts will be thoroughly and systematically worked. Ben Penhall of Grass Valley is aeting as superintendent of the mine.

Placer.

THE RISING SUN.—The Rising Sun mine at Colfax started up last week. It was formerly owned by the Coleman Brothers and paid a number of divideuds. A New York company has control of the mine now. A tunnel will be run in from Bear river to tap the ledge.

Plumas.

THE BUTTERFLY MINE.—*National-Bulletin*: Chas. D. Kellogg, Superintendent of the Butterfiy mine, west of Quincy, has gone to San Francisco to purchase four Frue Concentrators to use in connection with his stamp mill. The boiler and engine once used at the Riverdale has been moved to Butterfly and it is now heing placed in position so that the ten stamp mill may be run by steam. Undoubtedly the Butterfly mine is a success. There is ample ore in sight to keep the mill running a long time.

THE DRURY MINE.—The fifteen-stamp mill on the Drury mine started up last week. There are several hundred tons of ore ready for milling.

Riverside.

"INVESTIGATING."—Five Englishmen, representing the San Jacinto Estate, Limited, who own 47,000 acres, known as the Gavilan grant in Riverside county, are investigating the mines on the property with a view of opening up the most promising. The Temescal tin miues are located on the company's land.

THE GOOD HOPE.—Perris *Record*: During his visit at the Good Hope mine last Monday, Receiver Naftzger paid off and discharged all but a few of the men. These will be kept at work doing only what is necessary for the protection of the mine, such as pumping and keeping up the timbers. How long the mine will remain closed it is impossible to say, but it is believed operations will not be resumed until all litigatiou is settled, which may be several mouths distant. We are sorry for this, as the Good Hope has heen of great financial benefit to Perris. Nearly all the late employes of tbe Good Hope have left for new mining sections, many of them going to Arizona and Colorado.

Shasta.

AT IRON MOUNTAIN.—D. R. Cleary, one of the owners of the Iron Mountain miue, has arranged to have the wages of the eighty-five men employed there inereased.

It is reported that the Mountain Mining Company have accepted the survey for the new railroad from the mine to Spring Creek, and that they will build their smelter there with a capacity of 5000 tons per day.

THE IRON MOUNTAIN.—The Redding *Free Press* says: The survey on which the engineers have been at work is completed and a plant will be located near Copley capable of reducing 1000 tons of ore daily. Development work has shown a splendid ledge of copper ore, it is said that $10,000,000 cannot buy the property.

It also says that "Judge Cleary sold the mine to two factions in London, one of which represented the Rothschilds, through Hill, of the Rio Tinta mine of Spain; the other faction is represented by Fielding. These factions combined, put up $300,000 for the mine and $200,000 working capital. Cleary was given one-third of the stock, unassessable. Of the purchase priee, $300,000, Cleary paid to the original owners $205,000, thus making by the deal ahout $100,000 and a third interest in the property. It is stated that Cleary has combined with the Rothschilds interest, aud has become the master mind of the institution."

Tuolumne.

GENERAL NOTES.—*Union-Democrat*: The mine purchased by J. A. Weston, at Groveland, has been leased to the Wheeler-Hill Mining Company, which will soon commence work.

Eugene Elshree, of Sonora, took out $500 Wednesday in the Stewart-Wainwright claim. This makes a total of $3300 taken out hy him during three weeks last past.

Mr. Birney, of Saw Mill Flat, says that place is looking up, and that the following are some of the indications: Spencer, McNassau & Co. are representing and working the Geo. Winnie placer elaim. Zimdar and Griffen are mining out the Dunnegan ranch ground. Thos. Conlan and Ben Pownall are working the Marcus quartz mine. Thos. Conlan & Co. are hydraulicking the King and Hennessy placer elaim. Messrs. Ferguson and Hawley are reopening the Fox quartz claim.

NEVADA.

KENNEDY DISTRICT.—Ore is being hauled to Winnemucca from the Gold Note mine at Kennedy. A shipment of twenty tons was made this week to the Selby Smelting Works. It averaged nearly $100 per ton. It is thought possible that suitable works for treating the ores of Kennedy will be built this summer.

LINCOLN CO.

Improvements at the Bullionville mill are still being made, and the latest is the addition of a new fifty-ton leaching tank. At the Advance mine a body of gold ore is heing taken out from drifts at the bottom of an incline seventy feet deep, and the average on the three-foot vein is $40 per ton—a free-milling proposition which is being worked in the Bullionville mill. A tunnel is now being run in from the surface to tap the lower workings of the shaft, and the intention is to run tunnels at different depths.

Washoe District.

The following are official reports:

GOULD AND CURRY—200 level—West crosscut No. 5 started in northwest drift, 432 feet from main west drift, was advanced 11 feet; total length, 1,410 feet face in hard porphyry.

250 level—Resumed work in south drift and advaneed it 10 feet, passing through porphyry, clay and quartz; total length, 115 feet.

BEST AND BELCHER—250 level—Resumed work in the north drift and extended it 6 feet, passing through quartz and porphyry.

800 level—East crosscut started from north drift 75 feet from west crosseut; No. 2 was advanced 17 feet, passing through porphyry and stringers of quartz; total length, 32 feet.

CON. CAL. AND VIRGINIA—1,650 level—On ninth floor (first floor above sill floor of this level) at end of crosscut run west from drift, run south from east crosscut, from drift run south from south end of stope, an upraise has heen carried up 32 feet, in quartz formation of low value. On twelfth floor drift, running south from east crosscut, has been extended 15 feet; total length, 163 feet, in porphyry. On third floor from opening made, from drift run south from main north lateral drift, on sill floor of this level; the south drift has been advanced 25 feet; total length, 41 feet, in a quartz formation assaying $2 and $5 per ton. On second floor in working north have extracted 9 tons of ore assaying $25 per ton.

1,750 level—The opening on seventh floor, above sill floor of this level, has been enlarged to size of 16 feet in length by 6 feet in width, top being in ore 4 feet wide, assaying $30 per ton. From second, third, fifth, sixth and seventh floors have been extracted 144 tons of ore, making a total extraction for the week of 153 tons, the average assay value of which, per mine car samples, was $52.44 per ton. Bullion shipped tc San Francisco assay office value of $30,371.

OPHIR—1,465 level—Drift running north from top of upraise carried up 80 feet above sill floor of this level, from a point in east crosscut from main north lateral drift, has been extended 19 feet; total length, 365 feet. Face in porphyry and quartz of low assay value. Have continued jointly with Mexican company the work of making repairs in main shaft from 1,100 level upward.

Central tunnel, 250 level—Crosscut running west from main south drift from bottom of winze, sunk from tunnel level, at a point 95 feet south from winze, has been extended 30 feet; total length, 186 feet. In porphyry, clay and quartz of low assay value.

Tunnel level—West crosscut running west from end of drift, run north from end of west crosscut from north drift from Mexican shaft, has heeu extended 20 feet; total length extended, 186 feet. Face in porphyry and clay, showing more quartz. The upraise started from old north drift from top of upraiso, carried up 46 feet above tunnel level, at a point 110 feet in from its mouth, has been carried up 14 feet; total height, 32 feet. Top in porphyry and quartz, assaying $1 and $2 per ton. Are clearing out and repairing north drift from top of upraise, 117 feet above tunnel level, and with prospect westerly therefrom in coming week.

MEXICAN—1,465 level--North drift started from top of upraise carried up 45 feet above sill floor of this level, at a point 40 feet west of main north lateral drift and 100 feet north from south boundary of mine, has been advanced 20 feet; total length, 394 feet. Face in porphyry, which shows narrow streaks of quartz of low grade. As joint work with Ophir company are making repairs in Opnir shaft ou 1,100 level and upward.

HALE & NORCROSS--Main shaft—Are doing some retimbering below 975 level.

975 level—Advanced north drift from No. 1 west crosscut 20 feet; total length, 60 feet. Face of drift has connected with No. 2 west crosscut. South drift from No. 1 west crosscut has peen extended 10 feet; total beight, 158 feet. Face in clay, quartz and porphyry. Have done no work in west crosscut No. 3, near northern boundary, the past week. Will resume work in it in a few days.

Intermediate level—Continuo stoping south on small streaks of ore above this level. Shipped to Brunswick mill during the week 180 tons ore, being the entire accumulation of ore in ore house at this date, assaying, per railroad car sample, $55.50 per ton. The assay value of this ore per mine car sample averaged $51.40 per ton. The mill is expected to commence crushing ore to-day (the 25th inst).

ALASKA.

JUNEAU MINING CO.—*Record*: The Juneau Mining Company now has 75 men at work on their claims in the Basin and work is being pushed as rapidly as possible. It is the company's intention to have sufficient ore on the dump to start the mill as soon as completed.

ARIZONA.

SALE OF THE WATERS MINE.—*Courier*: A mining sale of immense importance was consumated in Prescott on Saturday last. It was the sale of Waters mine on the Santa Maria, for $40,000, by D. C. Thorne and Thomas Bowe. Clarence Clark, at present of Phœix, was the purchaser. Five thousand dollars was paid down and the balance is to he paid at stated times within a year. The purchaser has let a contract for a twenty-stamp mill which is to be completed within sixty days from date. The stamps are to weigh 850 pounds each, California pattern, and cyanide tanks will also he put in. The Waters is developed by over 400 feet of tunnel, and shows a strong vein of good milling ore. It is said that the purchaser has a large lot of contract work to let, and miners out of work may do well to inquire into the matter.

THE CONGRESS MINE.—*Journal-Miner*: The main shaft of the Congress mine is now down to a depth of 1,400 feet and a fine body of ore is exposed at that depth. This is as deep as they can sink with the present hoist. The old shaft will be sunk to an equal depth when the two will be connected by a drift. The company is now employing nearly 300 men. A cyanide plant of 100 tons capacity is approaching completion and will be used in working the old tailings. Another large plant will be erected soon to work a certain class of ore found near the surface and of which there are thousands of tons.

BRITISH COLUMBIA.

TRAIL CREEK'S WEALTH.—Rossland *Miner*: Trail creek is now producing $4000 a day in solid gold. During 1895 it will export $2,000,000 worth of the precious metal, or five per cent of the whole output of the United States. Who in Canada knows or cares anything about so comparatively uninteresting a fact, and what enterprising Canadian capitalist is reaching out a hand for a share in the golden shower? Trail creek is now greater than Cariboo in its palmiest days and more permanent, but British Columbian ears are so stuffed with the traditions of Cariboo that the noise of a present-day movement disturbs them no more than it would the lotus-eaters of Alfred Tennyson.

REOPENING OLD CARIBOO MINES.—An English company is reopening the old Cariboo placer mines—the old placer mines—and sending steam pumping and hydraulic machinery. These mines were abandoned many years ago after the miners had got out as much as they could of the surface gold. One of the mines held by the widow of an old-time miner, and unsalable before, has just been bought by the company for $30,000.

GENERAL NOTES.—The Peters Creek Mining Company has formed with $25,000 capital to work deep mines on Peters creek, near Stanley.

The Le Roi, War Eagle and Josie together are shipping 100 tons a day, most of which goes by Trail. The number of teams hauling has been increased.

The Blue Bell mine is shipping about 100 tons a day to the Pilot Bay smelter. An air compressor, electric-light plant and four drills will be put in. The wages paid are $3.50 a day.

Rossland miniug recorder's office took in $1400 in April for records and the general receipts were $2000.

GOLD HILL DISCOVERIES.—Marvelous stories are told of the new gold discoveries at Grouse mountain, just at the international boundary, seveu miles from Rossland, British Columbia.

Ten claims have been located, the property of Capt. Burbridge, Maj. Sidney Waters, W. J. C. Wakefield and A. Symous. The claims are named the Orizaha, Grouse, Alice, Phœnix, Ætna, Alpha, Alta, Knight Templar, Interuational and Tiptop No. 4. These claims are included in a rectangle about 4,500 feet on each side, just touching the international boundary, lying on the British side. In these claims, so far as now known there are nine gold bearing ledges running northwest and southwest, with two cross veins running nearly at right angles to them. These ledges, with the exception of one of the cross veins, are asserted to be free milling gold-bearing rock, averaging in widtb from three to fourteen feet, and, so far as known, assaying from $9.00 to $41.00 in gold to the ton. The ledges are porphyritic syenite formation.

COLORADO.

LEADVILLE FLUXING ORES.—One of the noticeable features in the miuing situation at tbe present time is the rapid increase in the argentiferous iron production, says the Leadville *Herald-Democrat*. There are some smelters which are not in the market, they still having a heavy supply on hand, but now that the contracts with the producers of Wyoming are expiring, the local and valley smelters are returning to their old market and a number of large contracts have been made.

IDAHO.

THE POORMAN.—*Inter-Mountain*: The reports from the Poorman property in the Cœur d'Alenes are encouraging at present, but tho outlook for the future is discouraging. At present about 190 men are employed, and some 300 tons of ore are heing miued of a low grade character. A rich strike was made recently on the east drift to the tenth level, which assayed fifty-uiue ounces in silver, forty-five per cent lead and bismuth, thirteen per cent copper, and $2 in gold.

The discouraging feature is the decision of the board of directors to stop work on the mine as soon as the bodies of ore on the east and west drifts of the tenth level are exhausted. The mine is excessively wet, and is now heing operated at a daily expense of $725. The pumping plant is an expensive one, compressed air being used to lift the water to the 500 foot level. At this point an electric pump earries it to the surface, its capacity being stated at 500 gallons per minute.

To continue operations it would be necessary to sink the shaft to an additional depth and to do so at the prevailing prices for silver and lead, with the heavy expenses entailed, would mean a great loss. Therefore, when the present ore hodies are exhausted, the pumps will be drawn and the Poorman will be hermetically sealed until the metal market improves.

MINING FOR MICA.—F. N. Hallett has ten men working in the mica mine near Juliaetta. There is a tunnel in 150 feet which shows good prospects. The owners intend to put on an increased force if mica is found in paying quantities.

NEW DEVICE FOR MINING.—H. M. St. Cyr is about to make the test of a new pump which is under construction at Portland, to be used in placer mining for pumping sand. The first experiment will be made on the Snake river, three miles below the mouth of the Payette. The pump is twenty inches in length aod eight inches diameter. It is on the end of a scow which contains washers connected with a pipe through which the sand is distributed. In the suction ehamber of the pump are four steel flukes, upon a central shaft braced with steel collars. The power of a twenty-inch pump is claimed to be sufficient to supply 400 tons of sand to each separating machine during twelve hours. In Mr. St. Cyr's mind this pump is one of the simplost devices ever introduced into the operation of placer mining.

MEXICO.

NEW GOVERNMENT REGULATIONS.—The new tax on gold and silver has become a law, and goes into effect on the 1st of next month. It

is the most important mining measure which has taken effect in Mexico in many years, and what its ultimate influence will be on the mining interests of this country is hard to foretell. American ore buyers are greatly wrought up over the new imposition of five per cent additional taxation, and freely prophecy that many companies, especially the smaller concerns, will be driven out of the Mexican markets, as aside from this tax there are the other long established state and national contributions to be paid. Others hold that the tax is not so bad as it looks, and that the government will not injure the mining industry by thus increasing its revenues. The full text of the new laws is as follows:

In addition to the taxes imposed by articles four, five and seven of the decree of June 6, 1887, silver and gold shall pay to the federation the following mintage, stamp, refining, melting, assay and separation dues:

From and after July 1 next the deduction hitherto made on the intrinsic of gold and silver entered at the mints for the purpose of defraying the cost and fees of mintage shall be abolished. In consequence, persons entering the precious metals shall be credited for each kilogram of pure silver at the ratio of $40.915 1000, and for each kilogram of pure gold at the rate of $675.417-1000. These values shall be taken as the basis for the estimation of the mintage and stamp dues hereafter to be mentioned.

(b) The mintage fees on gold and silver shall be reduced to two per cent of their value, payment of such fees being made in silver coin.

(c) The stamp imposed by the law of April 25, 1893, on the certificates issued by the mints and that imposed by the same law on gold and silver in bars, are hereby repealed, and in their stead a new stamp on gold and silver is created, the amount of said tax to be three cents per $1 on the value of the gold and silver. From the payment of this tax no one shall be exempted.

(d) The mintage and stamp dues shall be payable not only with respect to silver and gold entered at the mints, but with respect to bars of either metal, or of the two metals mixed, that may be exported. Also, with respect to silver sulphides, to argentiferous lead and copper, to ores in the natural state, to concentrates or ore only partially dressed, and to any alloy, object or substance containing gold or silver.

(e) The mintage and stamp dues shall be paid in the assay office or at the mints with respect to gold and silver introduced for coinage, and in the same offices or at the maritime or frontier custom houses with respect to gold and silver exported in any form.

(f) The only exemption from the payment of the mintage fee with respect to silver exported shall be enjoyed by the metallurgical establishments at present enjoying such exemption under their concessions, provided always that the proportion of silver argentiferous lead does not exceed seven-thousandths, and that in argentiferous copper fifteen thousandths, for in case the proportion of silver exceeds the amount named said establishments shall pay the mintage fee with respect to the excess.

(g) Ores of gold or silver exported in the natural state or only concentrated mechanically shall be subject to the mintage and stamp tax with respect to the value of the gold or silver which they contain, with allowances of five per cent.

(h) The exemption with respect to three-thousandths which all the exporters of certain classes of metal have enjoyed is abolished.

(i) The refining, melting, assay and separation fees shall be collected according to a schedule of prices to be formed and published by the treasury department.

(j) The owners of silver bars containing gold may have the separation of these metals performed in private establishments, and in case they introduce mixed silver into a government assay office they may have the gold separated up to the limit desired, on payment of separation fee per kilogram, in accordance with a schedule to be issued by the treasury department.

(k) The federal executive shall issue the necessary rules of practice for the enforcement of the above taxes, and shall fix the penalties to be visited on persons who shall attempt to evade or shall evade the payment of the taxes on gold and silver, of which the exportation without payment of mintage and stamp taxes shall be considered as a case of contrabband.

(l) From and after July 1 next all laws and regulations with regard to federal taxation on gold and silver opposed to the foregoing basis shall be repealed.

MONTANA.

THE ROYAL MINE.—W. Bennett brought in 450 ounces of gold bullion yesterday from the Royal mine, and deposited it as usual at the Helena assay office, says the Helena *Herald*. The value of the little lump of retort is about $7000, and it is the second deposit of the kind the Royal Company has made this month, the first deposit being 460 ounces, valued at about $7200. This makes a total in four weeks of $12,200, all pounded out of Royal ore by a ten-stamp mill.

Since September, 1893, when the mill was started, the Royal has produced $119,000, or an average of about $6000 per month, including a few months, when work had to be suspended on account of water. Month in and month out the profits are about one-half the total product of the mine, the mine being worked inexpensively by a system of tunnels, the ore being free-milling and the gold easily saved.

Heretofore the mining has been done by the primitive method of the pick and shovel, but now Mr. Bennett proposes to put in a modern drilling plant, with air compressors and all necessary machinery for operating air drills.

THE LONE PINE.—*Inter-Mountain:* The Lone Pine and Jay Hawk Mining Company closed down its mill at Ponsonby some four months ago, and at present but eight miners are employed in exploiting the company's properties on upper Quartz Hill.

The Lone Pine is in reality the deepest shaft in Montana, being 1900 feet on an incline into the bowels of the earth. It was originally located by the Partridge brothers, who worked it at a great profit for ten years and then sold it to a syndicate for $65,000. About six years ago the Jay Hawk Company, which was then operating a non-paying property in Marysville, purchased the Lone Pine for $350,000 and erected a twenty-five-stamp mill which cost in the neighborhood of $100,000. For two years the property turned out an immense quantity of silver, but at the 1100-foot level the vein was lost; and although the shaft was extended 800 feet farther at an enormous expense, no ore was found. This is practically the condition of things at the Jay Hawk to-day. The upper levels are worked out, and there is not a trace of ore at the bottom.

OREGON.

PLACER MINE SOLD.—Jacksonville *Times:* The sale of Ennis & Cameron's placer mines in Galice Creek district to Messrs. Bent and Alexander, formerly of Colorado, has been confirmed. The new firm will take possession as soon as their predecessors finish cleaning up this season's work, which will be the latter part of July. In the neighborhood of $20,000 was paid for the property.

IN THE GRANITE DISTRICT.—The ores of Granite mining district are principally gold, but more than one-half is contained in the sulphurets, says a writer in the Baker City *Democrat*. Following are the proportions of gold and silver of the principal mines: The Union, three parts gold, one part silver; Companion, same; May Flower, seven parts gold, one part silver; Red Boy, Stella and Forest Queen, same; Last Chance, three parts gold, one part silver; Eaton Bros.' mine, nine parts gold, one part silver; Golden Star, same; Moonshine and Maverick, three parts gold, one part silver; Mountain Chief, two parts gold, one part silver; Conundrum, nine parts gold, one part silver; Elephant and Poorman mines, three parts gold, one part silver; R. T. Lungrell's mine, ten parts gold, silver none; Tellegobhle mine, nine parts gold, silver none. The Tellogobhle is under bond for $50,000, and J. Barr Robertson pays for the same, should the property prove valuable.

GRANT CO.

BOUGHT AND BONDED.—The Elk Creek Mining Co., which some time ago bought the Sloan & Haskell placers for $27,000, have bonded the quartz properties for $23,000. They work nineteen men in the mine, from which gold has been taken out for twenty years.

BAKER CO.

SUSPENDED TEMPORARILY.—Mining and mill operations at the Baisley-Elkhorn mine have been suspended until the sale of the mine under execution in favor of the First National Bank of Baker City takes place, which will occur as soon as the proper publication of sale is made.

SOUTH DAKOTA.

HOLY TERROR SOLD. — *Mining Review:* A three-fourths interest in the Holy Terror mine, one-third interest in the N. Pope claim, one-third interest in the Star-eyed Egyptian Nos. 1 and 2, and a three-fourths interest in the Holly Terror mill and mill site, are sold. The purchasers are to sink to the depth of 300 feet from the bottom of the present shaft and to pay within fifteen days $22,500 of the purchase price, $82,500. The optional purchase is to extend six months from date of payment of the $22,500. John George and Charles M. Kipp, of Chicago, are the purchasers.

UTAH.

THE BULLION-BECK.—Tintic *Miner:* The Bullion-Beck has passed its regular monthly dividend, and it is stated that there will be no more dividend payments for some time, owing to the heavy expenses to which the company has been put recently.

THE MAMMOTH.—The recent ore strike in the Mammoth mine is more important than has been told. The ore body is on both the 1100 and 1200 levels, and is on an average three feet wide. It is very rich in gold, running from twenty to sixty ounces to the ton.

VIRGINIA AND GEORGIA.

GLITTERING GENERALITIES.—South Africa is not the only country where the gold hoomer gets in his fine work. Our own fair land has the same species. Coast miners will be amused at the following, which was received at this office this week:

"Last September the writer could buy for the first time any property lying on the south bank of the Potomac river at anything more than its surface value. In panning a bushel of dirt with a three-pint tin basin he found $7.50.

"The owner heard about the gold, but never went to see the land. Said it cost him less than $50 per acre and he could afford to sell for $100 per acre, $5000, which was accepted. A practical miner immediately asked for an option at $12,500 and other parties took an option from him at $25,000. A Pittsburg millionaire, who has a gold mine in Colorado that is paying him ten per cent per month, heard of the gold finds here and in the south, and sent an agent to examine. He selected eight yards of sand and washed it carefully and found $26 in nuggets without saving the fine gold. He estimated the sand in this gulch within reach of the river at 100,000 yards and immediately negotiated for an interest in the option. The average of some of the veins is from $88 to $126 per ton and the mine is sure to add largely to the millionaire's estate. Additional options have been taken on 150 acres of land at $100 to $300 per acre, which could have been bought two years ago for $25 per acre. While this condition of things exists ten miles from the national capital, agents are trying to sell in Washington California placers that will wash 15 to 25 cents per yard.

"A Washington mining engineer, Mr. S. J. Davenport, just from Lumpkin county, Ga., has loaned me a mining map of the county.

"Without counting, I should estimate over 100 mines working. One company is operating 600 stamps. Other parties are operating 10 to 20-stamp mills in all directions. One company has built 41 miles of main pipe line, 30 and 36 inches in diameter.

"Three dredges are at work on the Chestatee river, averaging from $100 to $1000 per day, and others are projected.

"Without doubt Lumpkin county is producing to-day more gold than Leadville, Cripple Creek or Deadwood. Northern mine owners are selling their property for what they can get and investing in the South. Atlanta is only 100 miles from this point, and the coming exposition will bring visitors to the locality and add to the mining boom. The Rothschilds are said to have four mining experts in the South selecting the choicest investments. John Gorham, the great manufacturer of silverware, has purchased three of the best mining properties and told me that he should set 500 men at work during the year."

The shysters will soon be abroad with gold properties in the South stocked at $1,000,000 to $10,000,000, and dupes will buy the stock at five cents per share.

WYOMING.

THE BABY BOY.—C. E. Griffin of St. Louis is at the Baby Boy gold property, near South Pass, and has a force of men at work changing the course of the Sweetwater river, which now flows over a heavy vein of gold-bearing quartz. The Baby Boy Mining and Milling Company was recently organized under the laws of Kansas, and has a backing of $5,000,000.

Riedler Pumping Engines.

Fraser & Chalmers, of Chicago, send a list of recent orders filled by them for the Riedler Pumping Engine, built for various municipal corporations, mining companies, etc., and say:

"To express the importance of the Riedler system in Continental Europe we have made a list of fifty large cities where it is given the preference, Berlin alone having some nineteen Riedler pumping engines of large capacity. This is by no means all, but it is enough to impress the mind with the consequence of the Riedler system. In the United States we have been engaged for only about two years in the manufacture of Riedler pumping and blowing engines, air and gas compressors. The dimensions and data of the pumps and compressors built and put in successful operation are given in the order of construction, and are enough to show a growing appreciation of the system in this country. The speeds stated are high, but not maximum, as higher speeds can readily be employed. For pumping, the Riedler system, with its positive closing water valves, secures singular avoidance of shock, and is found to work with beautiful smoothness and entire security at speeds which would imperil an ordinary pump.

"In addition to the list given, we have recent orders for a number, both of compressors and pumps. Among these, we are building for the Pennsylvania R. R. Co. a 12 and 19x16-inch cross-compound non-condensing slide valve engine actuating a pair of 7x16-inch Riedler duplex pumps. These illustrate the range of capacity readily obtainable. At 95 revolutions the capacity is 500 gallons against 600 feet head, but the speed may be increased to 142½ revolutions, with a corresponding increase in capacity.

"An engineering arrangement of less usual character is exhibited in the Riedler air-compressing pneumatic and pumping machinery ordered by the Delaware, Lackawanna & Western R. R. This will comprise, first, a 17 and 28x24-inch cross-compound condensing Corliss engine actuating a 14 and 23¼x24-inch compound air compressor. The capacity at 110 revolutions will be 1150 cubic feet of air per minute, steam pressure (initial) 100 pounds, air pressure 110 pounds. The air pressure will be transmitted about 3800 feet (3000 horizontally, 800 vertically), and will actuate, with a guaranteed efficiency of 90 per cent, a compound pneumatic engine 15 and 21½x18 inches, which in turn will drive two 5½ and 5¾x18-inch differential pumps. These, at 120 revolutions, will lift 700 gallons a minute against a head of 770 feet."

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from John B. Rathburn et al in the Lost Camp mine, near Blue Canyon. Placer county, to impound tailings behind brush dam in Woods Ravine; and from A. J. Mason, in the McFadden mine, near Mokelumne Hill, Calaveras Co., to impound tailings behind brush dam in Buckeye gulch, gives notice that a meeting will be held at Room 92, Flood building, San Francisco, Cal., June 17th, 1895, at 1:30 P. M.

ALBERT MALTMAN, Practical Metallurgist and Engineer.

SAMUEL C. THOMPSON, A. B. Yale University. E. M. Columbia University.

Maltman & Thompson,

MINING ENGINEERS AND METALLURGISTS,

Owners of Nevada County Reduction Works,

Address: Grass Valley, Nevada County, California.

Inspect and report upon Mineral Properties, Treat Refractory Gold Ores and Concentrates by Chlorination. Furnish Plans for and Superintend Erection of Colorination Plants, General Analyses of Ores.

References:

Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
Edward M. Preston, President Citizens' Bank of Nevada City, California

Professional Cards.

A. H. RICKETTS, Attorney-at-Law, Mining Patents and matters before the Land Department a Specialty. Crocker Building, Rooms 201, 202 and 203, San Francisco.

The Evans Assay Office.
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Practical Information.

The Skies of June.

In the south and southeast, but a short distance to the east of and below the beautiful white star, Spica, there shines during the June evenings the object in which the interest of planetary astronomy is centered at present. The steady yellow glow of Saturn, in the position described, is made noteworthy by the recent announcement of Prof. Keeler's discovery as to the composition of that planet's famous rings. A brief review of what we know of these unique appendages will make the latest news concerning them more intelligible.

As early as 1610, Galileo, while watching Saturn with his new-made telescope, saw that there were apparently three bodies making up the planet. A little later he looked again, but in the meantime the rings had been turned edgewise to the earth and were invisible in his glass. He uever explaiued the mystery; but Huyghens, in 1655, solved the problem and announced that Saturn was encircled by a ring. The next step in the progress of discovery was taken by Cassini, who found the ring douhle. Another division, making three rings iu all, was discovered by Bond in 1850. Since that time Saturn has been a favorite ohject in the telescopes of both professional and amateur astronomers. No other planet had such an appendage, and the beauty of the system with the eight satellites was such as to keep up the interest. Very little, however, was learned of these wonderful planetary girdles. The plane of the rings is inclined to the plane of the ecliptic at an angle of about twenty-eight degrees, so that twice in the planet's revolution of twenty-nine and one-half years the rings are turned edgewise to the earth. The whole ring system is ahout 36,000 miles wide, and there is a distance of ahout 10,000 miles hetween the inmost ring and the surface of the planet.

Of course the nature of these rings was an object of discussion as soon as they were discovered. The first and most natural theory, that they were solid, was overthrown hy a mathematical demonstration that such could not be the case and yet the rings survive; the same fate hefell the theory that they were liquid; and the only reasonable supposition left was that they were composed of a multitude of satellites, too small to he seen separately, moving in nearly circular orbits about the planet.

For a second time in astronomy has the observer confirmed the previous announcement of the mathematician. The existence and exact location of Neptune was demonstrated hy computation of the irregularities in the movement of Uranus before the former planet had heen recognized as such hy human eyes. Now Professor Keeler brings from his observatory photographic proof of the satellite theory of the composition of Saturu's rings.

Professor Keeler made his discovery hy means of the spectroscope. The spectra of the planet and the two opposite sides of the rings were photographed on the same plate, and it was found that the inner edges of the rings moved faster than the outer edges—a condition which could not be true if the rings revolved as a whole. An attempt has heen made to deprive Professor Keeler of the credit for his work hy alleging that he only has confirmed what had previously been announced hy other astronomers and what has heeu the generally accepted theory for the past twenty years. Granting all this to be true, Professor Keeler has brought the first visual proof that the rings are not solid, aud that fact is enough to make him famous among the astronomers who have contributed to our knowledge of this distant world.

Saturn, as has heen said, is to the east of and helow Spica, in the constellation Virgo. The planet comes to the meridian or is due south at 9:20 P. M. on the 1st of June, 8:22 P. M. on the 15th and at 7:22 on the 30th. As an additional means of identification, the moon is in conjunction with Saturn ou the night of June 3d, although some seven degrees farther south than the planet.

Of the other planets, Mars, Jupiter and Mercury are all in the western sky during early June, but all are so near the sun as to make it difficult for the amateur astronomer to distinguish them. Mercury may be found low down near the west-northwest horizon about an hour after sunset during the first four or five days of June. It will take a good glass to find the shy planet, as, although he is farther from the sun than he was at the elongation last Fehruary, his disk is not uearly so bright.

Jupiter is rapidly approaching the sun. He is in conjunction with Mercury twice during the month—once on the morning of the 7th and again on the evening of the 21st.

Of Venus no words of praise or description of location are needed. The queen of the planets is superior to anything the June skies can present. She reigus supreme in the western heavens all the early evening. Find the hrightest object in the west as soon as the twilight hegins to deepen, and that is the planet Venus. Next month she reaches her greatest distance east of the sun and soon afterward attains her maximum brilliancy.

Three first magnitude stars are the conspicuous ohjects of the eastern sky during the June evenings. They are Antares, Altair and Vega. The first may be seen low in the southeast after nine o'clock on the 1st of June and after eight o'clock on the 15th, and may he recognized hy its fiery red color. Its very name, Antares, means "rival of Mars," and it can well be compared with the reddish hue of the planet so prominent in the east last autumn. Antares is in the constellation Scorpio and in one hranch of the Milky Way. Rising a little later and farther north is Altair, marked hy two hright attendants—one on each side. The arrangement is so peculiar that it attracts attention at once. Thc constellation is called Aquilla, the eagle. Although one will have no trouhle in finding Altair, it is difficult to discover any resemhlance to the great American bird in the collection of stars of which Altair is the chief. In fact, there are very few constellations which at all approach in appearance the ohjects they are named after. When an amateur begins watching the stars, it is the bright ones he first picks out, and the knowledge of the constellations comes later. The other first magnitude star, Vega, is high in the northeast at nine o'clock on the 1st of June. Steel hlue in color, hrighter than any of its neighbors, it is an easy object to distinguish. Vega is one of the three brightest stars north of the celestial equator. The others are Arcturus and Capella. Arcturus at this time holds a position almost overhead. The curve of the three last stars in the handle of the dipper, if produced, comes to Arcturus. Capella is setting in the extreme northwest, not to appear again until, in the last of August, late in the evening, its rays appear above the northeastern horizon and herald the approach of winter, for it shines nearly overhead at nine o'clock on the January evenings. These three stars—Vega, Arcturus and Capella—are of nearly the same hrilliancy, and each is beautiful, but in a different way.

Dagos and Gringos.

There can be no doubt that the word Dago is derived from the Portuguese word Diego (James), the patron saint of Portugal. Ahout thirty-five years ago an exhaustive research was made to ascertain the derivation of this word, with this result: The first recorded instance of its use was a customs entry, about the year 1820, of a ship belonging to Davis & Brooks, which traded hetween New York and Mediterranean ports. The skipper, after writing in the entry his name and that of his mates and American sailors, wound up with and "three Dagos." He was asked for an explanation hy the Custom House people, showing that the word and its meaning was new to them. He replied that he meant three Portuguese, all of the same name, Diego, which he had spelled incorrectly, and that he had shipped them at Funchal.

In those days Italian sailors were seldom found out of the Mediterranean, and Spanish sailors only on Spanish ships, but the Portuguese sailors would take a berth on any craft without regard to the flag it sailed under, so it was very hard to find a ship without two or three natives of either the Azores, Canary, or Cape Verde islands among the crew. They made splendid sailors and worked cheap, an important consideration in the eyes of Yankee skippers, particularly whalers, who invariahly sought these islands on their way to the Pacific to complete their crews and catch the southwest trade winds.

The name Diego was so plentiful among these Portuguese sailors that it got to be the custom to call them all "Diego" or dago, much as all the Chinamen are called John. As they were a good-natured lot they took it kindly, until along in the 40s the manner of its application became offensive to them. Since then it has been appiled to Spaniards, Italians and all dark-skinned people other than negroes.

An equally iuteresting story can he told of the word gringo, so much used by our Mexican neighbors. The accepted version of this word's origin is to the effect that some American sailors, ashore on the harhor of Mazatlan, getting water, sang the old ditty, "Green Grow the Rushes O," and the natives took kindly to the melody, ever afterward calling the Americans gringos. The year 1845 is given as the date of this happening. Now, as long ago as 1825 the firm of Howland & Aspinwall did an immense business with the west coast of Mexico. Their agents in Mazatlan were the Messrs. Barre & Kennedy. There is in New York city, in the family of Robert Lennox Kennedy, a letter from Mr. Lewis Barre of this firm, dated Mazatlan, 1825, which speaks of an entertainment at his house, and that on the recommendation of one of the captains of Howland & Aspinwall's ships in the harbor, a sailor furnished the music. The captaiu vouched for him as heing a very talented fiddler, and it turned out that the fellow played but one tune, "Green Grow the Rushes O." This was his entire repertory. They danced everything to this tune, singing the song at the same time, and the entertainment furnished lots of fun.

In a subsequent letter he writes that from this entertainment his Mexican friends had evolved a nickname for Americans that was coming greatly into use, gringo, which was as near as they could come to the pronounciation of "green grow." It is easy to see how this word could become a word of opprohrium among people who did not know its origin. Certain it is that, Mr. Barre, an old and respected merchant in Mexico, had never heard of it previous to this time, 1825.

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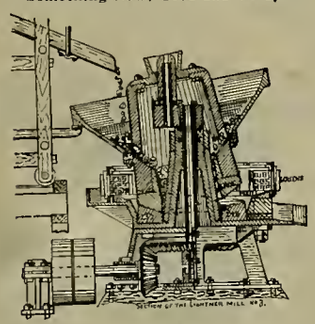

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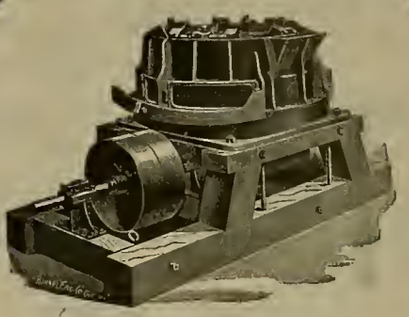

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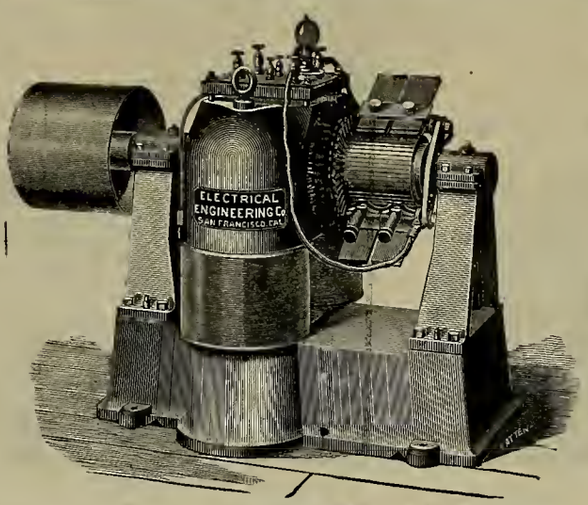

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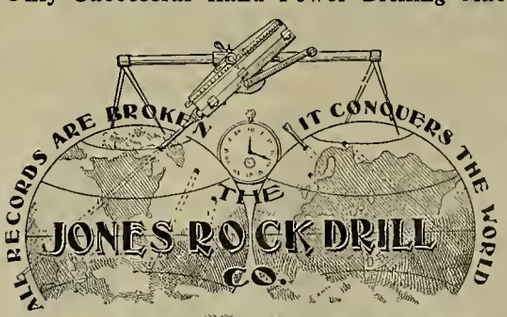

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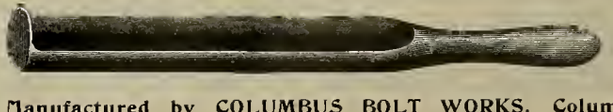

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Market Reports.

The Markets.

SAN FRANCISCO, May 30, 1895.

There was scarcely any change in the markets during the week, lead dropping a few points from the recent advance. Silver holds up, hovering around the 67 mark. The Chinese indemnity calls for 51,000,000 oz. of silver yearly. There is thought to be 700,000,000 oz. of silver in China now, but it is doubtful whether the Government will be able to get hold of it, and must go to Europe for a loan. China must pay Japan 372,668,000 silver dollars, or its equivalent in bullion, which Japan proposes to spend at home in strengtheuing her navy and coast defenses, and providiug war material exhausted in her recent struggle with Chiua. A London special says: "With the decline in New York exchange, the demaud for gold in tbe open market has entirely disappeared."

New York Metal Market.

NEW YORK, May 30.—PIG IRON—Scotch, 19@20c; American, 9.50@10.50c.

COPPER—Brokers', 10.50c; exchange, 10.60c.

LEAD—Brokers', $3.07½; exchange, $3.10.

TIN—Straits, 14.85@14.95c.

SPELTER—Domestic, $3.60.

New York Silver Prices.

NEW YORK, May 30.—Following are the closing prices for the week:

	Silver in—			
	London.	N. Y.	Copper.	Lead.
Friday	30⅜	67	10 50	.....
Saturday	30⅜	67	10 50	3 10
Monday	30⅜	67	.....	3 10
Tuesday	30⅜	67⅛	.....	.....
Wednesday	30⅜	67⅛	10 50	3 10
Thursday	30⅞	67¼	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum.....7@8
Commercial Loans, prime.....6@8
Call Loans, gilt edged.....7@8
Call Loans, mixed securities.....7@8
Mortgages, prime, taxes paid by leuder.....5
New York Sight Draft.....2½c
New York Telegraphic Transfer.....5c
London Bankers' 60 days.....$4.87½
London Merchants.....$4.86
London Sight Bankers.....$4.89
Refined Silver, per ounce.....67¼c
Mexican Dollars, nominal.....54

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt ⅜ & 5-16, 17c; ⅝ and larger, 16c			
Lake Superior Sheathing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17
TIN PLATE.			
Per box	5 25	@	6 00
PIG TIN.			
Per lb	15	@	16 00
ZINC.			
Sheet	8¼@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do. " "			1 45
QUICKSILVER.			
Home trade, per flask	39 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 75
Nanaimo			6 50
Gilman			6 00
Seattle			7 00
Coos Bay			5 50
Cannel			10 50
Egg, hard			12 50
Wallsend			7 50
Scotch Splint			7 50
Brymho			7 50
West Hartley			8 75
TO ARRIVE—CARGO LOTS.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumbertand	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
COKE.			
Gas Companies'			75c ₱ bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00
NAILS.			
Wire			$1 75
Cut			1 55

Mining Share Market.

SAN FRANCISCO, May 30, 1895.

There was a general improvement in the market this week, and a better feeliug imparted by the proposition discussed at length elsewbere to consolidate some of the Comstock properties, explore new ground and co-operate with the new management of the Comstock Tunnel Company. Such action would infuse business vitality into the market.

Bodie Con. tumbled 50 per cent in price during the week by reason of the Standard Company's suit against it for $283,000, value of ore alleged to have been taken by the former from the latter's ground during the years '84–'89.

Discussing the proposed consolidated purchase of part of the Brunswick lode, the Virginia *Enterprise* says:

"It is almost certain that rich ore will be struck at some point in the Brunswick lode if it is thoroughly explored. The history of the Comstock shows that the croppings were not particularly rich in character, and if a private individual had owned the Con. Cal. & Virginia miue it is altogether probahle that its wealth would never have been unearthed, as an immense amount of money was expended in prospecting before the bonanza was struck. The Brunswick lode is immense in size. Its croppings are all mineral-hearing, and in many places tbe owners of claims on it have taken out great sums of money by gouging near the surface. The Brunswick lode is, if anythiug, more promising in character than was the Comstock before it was developed."

The following illustrates the changes of the week:

MINES.	23	29
Alpha	...	...
Alta Consolidated	...	$ 07
Andes	$ 12	10
Belcher	50	43
Best & Belcher	47	47
Bodie	1 00	62
Bullion	...	11
Challenge	24	21
Chollar	25	.....
Confidence	94	.....
Consolidated California and Virginia	2 35	2 35
Consolidated New York	03	...
Crown Point	51	43
Exchequer	...	...
Gould & Curry	28	...
Hale & Norcross	90	87
Justice	03	...
Mexican	42	39
Ophir	1 35	1 35
Overman	17	18
Potosi	37	37
Savage	38	36
Sierra Nevada	52	50
Union	46	30
Utah	...	...
Yellow Jacket	52	44

San Francisco Stock Board Sales.

SAN FRANCISCO, May 29, 1895.

9:30 A. M. SESSION.

250 Andes	10	300 Con Cal & Va	2 35
100 Best & Belcher	45	200 Mexican	39
50 "	46	100 Ophir	1 30
900 Bodie	62	500 Overman	17
100 Bullion	11	100 Potosi	37
100 Hale & Norcross	86	100 Savage	36
100 "	87	200 Sierra Nevada	50
200 "	85	300 Yellow Jacket	44

SECOND SESSION—2:30 P. M.

150 Alta	07	300 Kentuck	02
200 Andes	09	300 Mexican	39
300 Belcher	43	200 Occidental	19
50 Best & Belcher	47	100 "	18
100 Bodie	61	400 Ophir	1 35
300 "	62	500 Overman	18
400 Bulwer	06	150 Potosi	36
200 Challenge	21	1300 S. B. & M	13
200 Con Cal & Va	2 35	100 Union	30
100 Crown Point	43	50 "	29
100 Eureka	25	100 Yellow Jacket	43
800 H & N	80	100 "	44

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING MAY 21, 1895.

539,605.—SURVEYING INSTRUMENT—Batter & Murphy, Marshfield, Or.

539,765.—ENGING BOXES WITH METAL—M. A. Clennam, S. F.

539,511.—SIGNAL BOX—A. Gruuer, S. F.

539,512.—RELAY—A. Gruner, S. F.

539,737.—TREASURE GUARD—R. A. Hahersham, Portland, Or.

539,741.—HINGE—W. L. Ingram, Grants Pass, Or.

539,538.—BALING PRESS—J. J. Mathias, Mountain View, Cal.

539,485.—PILE COVERING—J. Berret, Everett, Wash.

539,545.—CLOSING, ETC, ENDS OF CANS—A. J. Ritter, Mammoth, A. T.

539,455.—SACK FILLER AND SEWER—A. T. Timewell, Spokane, Wash.

539,461.—CINCH PLATE—A. P. Weeks, Santa Cruz, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained tbrough Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SURVEYING INSTRUMENT.—Frank Batter and William Murphy, of Marshfield, Oregon. No. 539,605. Dated May 21, 1895. The object of this invention is to provide an instrument which, while not of exceeding accuracy or convenience of construction, is suitable to be placed in the hands of boys and learners for the purpose of assisting them in learning the rudiments of this class of 'mathematical work and the use of instruments connected therewith. It consists of a box having sockets in its sides whereby it may be detachably supported in different positions upon a tripod, observation tubes pivoted upon one of tbe sides and movable about their pivot points, graduated quadrants attached to and turnable with the tubes, with locking thumb screws to hold them in any desired position, and a circular revolvable dial pivoted to the side of the plate and having a cord passing around its shaft connected at one end with one of the quadrants and at the other with a tension spriug, and a plumh line so arranged that when the apparatus is set on edge it may he properly leveled for work.

MEANS FOR CLOSING ENDS OF CANS AND READILY OPENING SAME.—Andrew Jackson Ritter, of Mammotb, Ariz., assignor of one-half to G. H. Barnhart, same place. No. 539,545. Dated May 21, 1895. This invention relates to the class of devices for soldering or otherwise closing the ends of tin cans and which will permit of tbeir being readily opened again. The device consists of a trough or channel ou tbe can body, formed by returning the edge of the can body parallel upon itself and then bending it upwardly and outwardly; a cover for the body, having a depending flange adapted to enter the trough or cbanuel; a wire fitting said trough or chaunel and practically filling the space between its outer wall and the flange of the cover, and a breakable layer of solder bridging the trough or channel over the wire and connecting the wall of the trough or channel witb the cancover flange. To opeu the can a projecting end of the wire is grasped, and the wire is torn forcibly from its seat, the solder, which is a thin layer, yielding readily. The solder heing thus broken, the fastening between the cover and can is severed and the two may be easily separated.

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ANY ONE KNOWING THE ADDRESS OF

GEORGE P. HARRIS

Will confer a favor on the undersigned by writing the desired information to the address given below. Mr. Harris left Albany three or four years ago for Colorado, and a letter of inquiry to his brother elicited the information that his address was Trinity Centre, Trinity Co., Cal., but a letter addressed to him there was returned marked "uncalled for." E. J LANNING, Albany, Oregon.

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ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alpha Con, Nev	14	5c	May 23, Jun 27, July 18	C E Elliott, 309 Montgomery
Alta M Co, Nev	49	10c	May 6, Jun 11, July 2	J E Jacobus, 309 Montgomery
Andes S M Co, Nev	41	15c	May 1, Jun 1, Jun 17	J W Twiggs, 309 Montgomery
Chollar M Co, Nev	40	25c	May 14, Jun 15, July 11	C E Elliott, 309 Montgomery
Gold Bar Cons M Co., Cal	1	2c	May 24, Jun 29, July 22	E C Godfrey, Crocker Building
Hale and Norcross M Co	107	20c	May 29, July 3, July 25	A B Thompson, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19, May 31, July 26	J Henry Smith, 431 California
Justice M Co, Nev	59	10c	May 7, Jun 11, Jun 28	R E Kelly, 309 Montgomery
Mexican G & S M Co, Nev	52	25c	May 13, Jun 17, July 10	C E Elliott, 309 Montgomery
Overman, Nev	73	10c	Apr 15, May 21, Jun 11	Geo D Edwards, 414 California
Savage M Co, Nevada	86	20c	Apr 19, May 22, Jun 11	E B Holmes, 309 Montgomery
Yellow Jacket, Nev	59	25c	Apr 15, May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Chollar, Nev	C E Elliott, 309 Montgomery	June 12
Crown Point G & S M Co. Nev	Jas Newlands, 35 Mills Building	June 3
Potosi, Nev	C E Elliott, 309 Montgomery	June 12

Assessment Notices.

ALTA SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of May, 1895, an assessment (No. 49) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 11th day of June, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on TUESDAY, the 2d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. E. JACOBUS, Secretary.

Office, Room No. 33, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

ANDES SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virgin a City, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the first (1st) day of May, 1895, an assessment (No. 41) of Fifteen (15c) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Rooms 20-22 Nevada Block, 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the first (1st) day of June, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on MONDAY, the seventeenth (17th) day of June, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JOHN W. TWIGGS, Secretary.

Office—Rooms 20-22 Nevada Block, San Francisco, California.

GOLD BAR CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, La Porte, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 24th day of May, 1895, an assessment, No. 1, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of June, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 22d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

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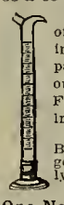

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc. Including, also, a full stock of Chemicals.

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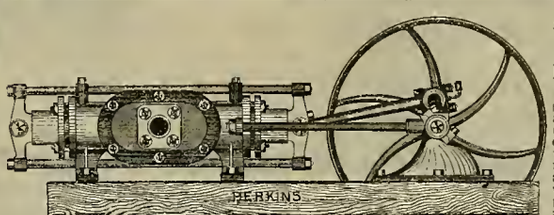

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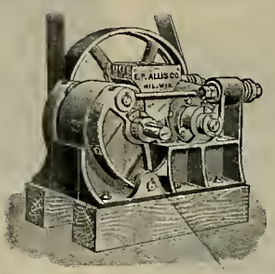

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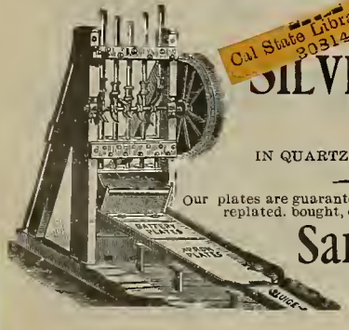

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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXX. Number 23. SAN FRANCISCO, SATURDAY, JUNE 8, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

California Granite.

The ancient, intrusive granite is one of the most noted and abundant of California's structural materials, being present and unsought in nearly every county in the State. There are almost as many varieties as localities where found, the general term "granite" being applied to many masses of rock that strict mineralogical classification would place differently.

In many parts of the State railroad facilities have made possible the opening of granite quarries, the commercial value in several instances being considerable. In Placer county, at Rocklin, Griffith, Gould & Towles, and Penryn, are large quarries constantly worked, and from that locality has come much of the granite in use in this city. At the Griffith quarries, near Penryn, is opened up what is said to be the only true black granite quarry in the State. Extensive polishing works form a part of the quarrying plant at this point. The State Prison granite quarry at Folsom, Sacramento Co., also furnishes a large amount of granite. Considerable granite quarrying is also being done in the southern part of the State. One of the largest granite quarries in the world is about three miles southeast of Raymond, Madera county, a light gray granite of even texture, so lying as to admit of separation into immense blocks. One is described about two years ago as having the entire force of 70 men then at work on it; it was 325 feet long, five to fifteen feet in thickness, and exposed for fifty feet in width, without seam or flaw. Views on this page and on page 361, engraved direct from photographs, give a good idea of the appearance of this quarry. Another view is also presented of a notable quarry of syenitic granite at Rocky Point, near Exeter, Tulare Co. The cut shows ancient Indian painting, and the more practical effects of the modern blast. In quarrying at Rocky Point, two holes are drilled about fifteen inches apart, and at such an angle that they intersect about six feet from the surface. They are first charged with six inches of black powder and fired; then loaded with eight inches of black powder and fired again; the third charge consists of twelve inches of black powder. In this way a block 40×40×25 feet is split through its greatest length.

ROCKY POINT GRANITE QUARRY, TULARE COUNTY, SHOWING INDIAN PAINTINGS AND EFFECT OF A BLAST.

RAYMOND GRANITE QUARRY, MADERA COUNTY.

Some weeks ago it was stated in this column that it was no longer fashionable to talk of "hard times" in the East. It is largely a habit, this talk of "hard times," a habit that is chronic with many. Times are always "hard" with some people, despite any amount of money they may be making. In the industrial world an increased volume of business East and West is manifest, and increased wages by many leading firms is notable. To date 247 companies, firms and individual employers have announced an increase in wages from five to twenty per cent. In all but two of the 247 the increase was made voluntarily. The 247 noted are nearly all iron and steel workers, giving employment to nearly 200,000 men and boys. Doubtless statistics in other lines of trade and manufacture would exhibit equally gratifying results. The case of the Carnegie Steel Co. is illustrative of the improved condition of affairs. The 15,000 employes of this company, as its several plants at Homestead, Braddock and Pittsburg, Penn., were working under contracts by which their wages were fixed for the year 1895. The company informed them May 14th that "notwithstanding the existing contracts," it had "decided that the present business outlook will justify higher wages," which were accordingly advanced ten per cent beginning last Monday. The firm of Jones & McLaughlin, of the American Iron Works at Pittsburg, voluntarily increased the wages of 4000 men, and the Consolidated Steel and Wire Co., of Chicago, did the same in their five big mills near Chicago. These several advances put the wage rate almost back to what it was in '92.

MINING AND SCIENTIFIC PRESS.

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Our latest forms go to press on Thursday evening.

Entered at the S. F. Postoffice as second-class mail matter.

J. F. HALLORAN.....General Manager

San Francisco, June 8, 1895.

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Transmission of Power.

In the issue of May 18th, Mr. E. A. Rix contributed an article "Notes on Recent Compressed Air Plants," in which were discussed the details of several large air compressors being made for different parts of the State, more especially the 700 H. P. plant to operate the pneumatic guns at the Presidio, and the similarly notable apparatus designed for the North Star mine at Grass Valley, and deduced conclusions therefrom regarding the relative value and economic merit of compressed air and electrical transmission, commendatory of the former, in instituting a comparisou as to cost and limit of efficiency. The article has elicited considerable comment, and Mr. A. M. Hunt has replied to it in an article entitled "Compressed Air vs. Electric Power Plants for Mining Purposes," in which he takes issue with Mr. Rix and challenges the correctness and accuracy of his statement. The closing sentence of Mr. Rix's article was.

> It is entirely probable that any ordinary compressed air transmission can be installed at no greater expense than an electrical one and with better economic results.

The closing sentence of Mr. Hunt's rejoinder was:

> It is entirely probable that an ordinary electric transmission can be installed at less expense than a compressed air one, and with better economic results.

This, then, may be regarded as the central contention of the disputants.

Without the slightest claim to originality, and with the fullest knowledge that this has been pointed out before in better phrase and clearer manner than the writer can command, it is in order to observe that while the PRESS welcomes the discussion as tending to better establish the merits of both systems of transmission, that there really exists no rivalry: the matter is more co-operative than competitive. As in other forms of transmission there need be no antagonism between compressed air and electricity, each having a separate field of usefulness.

It is usual and natural for any well-informed man to zealously present the potency of any form of power or transmission of power which he represents and thoroughly understands, and such commendation is always commensurate with his belief in that particular form of energy with which he is most familiar. It is a matter of congratulation to the industrial world that the meager past broadens into a future of such promise, and that in the multiplicity of devices for development of power there exists such variety, capable of adaptability to any and every use.

It is not unusual to attempt to ignore or decry the steam engine: prophecies have been made that the gas engine would relegate to obscurity every other mode of creating or transmitting power; others have declared that the oil engine was par excellence the coming furnisher of impulse, and still others demonstrate that when it comes to efficiency of transmission the water wheel beats them all. All are partly right, none wholly. There is room for all: it is not a question of one job where one of the applicants is hired and the others are left: there is enough demand for each and every form of originating or carrying power, and neither steam nor compressed air nor electricity nor water nor anything else fills the field to the utter exclusion of all else.

In additiou, it may be said partly to clear away a little indistinctness in several communications received on this subject that the difference between a creator of power and a transmitter of power must be kept in mind. The cable that pulls along one of our city street cars simply transmits power—the power that the steam engine in the power house evolves through the medium of the fuel that feeds the boiler. Neither compressed air nor electricity can be considered as originators of power, though each makes a splendid transmitter of power. In this regard the much-abused steam engine that so many claim will soon be superseded has much the best of it, for it can and does create or evolve or originate power. Yet we do not view the steam engine as a competitor or rival of the air compressor or the electric motor any more than we view the two last named as competitors or rivals of each other. There are things that the air compressor can do better than the electric motor: there are things that the electric motor can do better than the air compressor: there are things that each or either can do better than the other. We consider the great and growing use of the one an excellent argument for the use of the other. There are conditions in which each is most effective, and neither one of them can do everything that the other can do.

There is so much to be done in the industrial world, and in these days of keen wits and close competition it is so necessary to success to do it in the best way, that it is well that in varying circumstances and differing conditions one has a choice of how power shall be evolved and transmitted, and from among the splendid creations of man's inventive genius can choose that best adapted to the immediate work in hand.

Since the above was in type an additional communication has been received from Mr. Rix, which is given space elsewhere, which is intended to bring the matter from the abstract proposition to a concrete demonstration, a specific case. All earnest, honest discussion elicits the truth, and in this as in other matters, intelligent controversy will add to the sum total of knowledge on the question.

As a business proposition, or a working proposition, it seems a mistake, though a common one, to have such extraordinary capitalization in the organization of mining companies. It is an every-day occurrence to hear of a new mining company organized "capital stock $1,000,000," "$5,000,000," or "$10,000,000." The enormous sum deceives nobody, and is usually an indication that legitimate mining is the last thing intended. Very seldom are seven figures necessary in announcing the capitalization of a mining company, and in those cases the names of the incorporators are the best indication of the corporate intent.

THE American Iron and Steel Association sends its annual report, a publication of unusual value. The statistics show an extraordinary fall in prices, yet an output greater than that of any year since '89, a compensatory showing that is suggestive of the highest form of mechanical progress. Improvement in methods and cost of manufacture have enabled the iron and steel interests of the country to pass through the stress of the past three years, meet foreign competition and export $30,000,000 worth annually, besides supplying nearly all domestic demands.

THE several trade journals received from "the East" show by their advertising columns that there is general business activity. There is no certain nor better business barometer than the advertising columns of a live journal in any branch of industry. Business in nearly every line is good, gives promise of being better, and the man who croaks "hard times" has no longer a semblance of truth in his plaint. It has ceased to be fashionable and is a reminuisance.

Last Thursday's Meeting.

The Executive Committee of the State Miners' Association was called to order by President J. H. Neff in the Maple room of the Palace Hotel at eight o'clock last Thursday evening. Secretary Ralston read sundry communications, among them one from the Selby Smelting Works, contributing $200. A communication from R. L. Dunn, of Auburn, regarding the reported desire of the railroad company to act in a spirit of fairness and justice, said, among other things, that:

> "For more than ten years past it has been the practice of the representatives of the land department of the Central Pacific railroad, at the hearings called by the local Land Offices for the purpose of having all interested parties present evidence as to the mineral or non-mineral character of the land listed by them, to represent to the mineral witnesses and claimants that, in order to avoid expense, if they, the mineral claimants, would not offer testimony the railroad would not, and that the effect of no testimony being offered would exclude it from listing at that time.
>
> "I have personal knowledge of this practice in that at one such meeting, when I had made surveys and maps of mines on listed lands and was present at the request of mineral land claimants to offer the maps in evidence, such representations were made to me and my principals, the attorney of the railroad saying, in fact, that our statements were sufficient as to the fact of the mines being there; that we need not go to the expense of giving testimony; that he would strike those lands off the list. Relying on such representations, the good faith of which we did not question, the maps and evidence were not offered.
>
> "As a fact, however, these lands were not stricken off of the list, but the representation was made and accepted in the Land Office (the hearing was held in Auburn), the attorney representing the railroad there being the same who had acted at the hearing, that inasmuch as no mineral evidence was of record at the hearing the land was therefore agricultural and should remain on the list. The register accordingly certified them as clear of mineral and ready for patenting to the railroad. I discovered this latter fact several years later.
>
> "I am informed, and believe, that the same course of fraud was practiced with reference to many others of the railroad lists. To the particular one cited above I am ready to make affidavit and appear in court if desired by your committee."

A. H. Ricketts made verbal report of his recent visit to Washington and the results. W. C. Ralston gave an account of his visit there at the same time, and of the stultifying and contradictory action and language of the officials in the Land Office Department. The report of the Committee on Mineral Lands was read. It recited the facts already reported, and asked for further advice and instruction. Treasurer Sontag read the financial report, showing that the receipts from Nov. 1st, '94, to June 1st, '95, were $4101.52, and the disbursements $4071.47. Discussion of ways and means to further the work and secure necessary funds was participated in by Messrs. Cross, Wright, Ricketts, Ford, Montagne, Neff and Ralston. Mr. Cross's motion that a form of protest, with explanatory circular as to how to prepare it to meet the exact requirements of the land officials, be prepared and furnished the miners of the State, was considered. Mr. Ricketts directed attention to the fact that the Government Land Office was controlled, in its regular routine work, by the clerks and underlings, who, in defiance of general rules, could and did favor the railroad company, regardless of the Secretary of the Interior, whose enormous mass of general business precluded any probability of special attention to any detail. Mr. Ralston's belief was that the Government Land Office was favorable to and largely controlled by the Southern Pacific Company. In this Mr. Ralston's experience agrees with that of everyone who has had business therein. Mr. Wright stated that he had heard intimated that a proposition was in abeyance from the S. P. Co. regarding an amicable adjustment of the matter of mineral lands. Mr. Crawford said that in conversation with Mr. Mills, the S. P. land agent, regarding the hostility of the Sacramento *Record-Union* to the mining industry, that Mr. Mills had stated that Mr. Huntington authorized him to propose that the association appoint a man, the S. P. Co. another, the two to travel together over the State and report what are and what are not mineral lands. The committee took no action in the matter. Mr. Loftus of Sonora had the secretary read an advertisement in a Tuolumne Co. paper of the intention of the Tuolumne supervisors to receive bids for a franchise for fifty years to build dams and charge toll on the Tuolumne river, and said that was a corporation scheme to control the water, and that, if successful, not only the mineral lands, but the water necessary for their working, would be tied up, and moved that the association send a protest to the Tuolumne supervisors, which, after some debate, was carried.

President Neff, Secretary Ralston, Senator Ford, chairman of the legislative committee, John M.

Wright, of the committee on protection to mineral lands, W. W. Montague and A. Carrigan, spoke earnestly regarding the need of money. San Francisco had done a great deal in the matter of contributions; had given readily and liberally, and would do more, but many of the mining counties where live the men in whose direct interest the contest was being made had not even sent their quota. Whether not realizing its importance, or through indifference, the contributions were either lacking or insufficient. The association committees were devoting their time to forwarding the work and funds were needed to properly carry it on. Senator Ford suggested that, inasmuch as the supervisors of the valley counties annually contributed thousands of dollars to the Anti-Debris Association, it was but just that in direct furtherance of their own interests the mining counties do the same toward sustaining the association that was fighting their battles for them. He made further plea regarding the new bill recently drafted by the Legislative Committee, and which will be presented in Congress next December, which amends Chapter 6 of Title 32 of the Revised Statutes of the U. S., transferring mineral land contests from the control of the Land Department to that of the courts of the counties wherein the land is situated. President Neff moved that the committee on mineral lands be authorized to continue its work and assured payment of its expenses, which was carried. He spoke at length on the condition of the association, thanked the press for the favorable publicity given its work and made an earnest plea regarding its financial needs, which are imperative. The meeting adjourned at 11:30 P. M.

These columns are held open twenty-four hours longer than usual to secure this brief recital of a very important meeting. As so urgently stated Thursday night, while the committees of the Association are thoroughly equipped and so ably and intelligently laboring for the prevention of absorption by the railway corporations of the mineral area of the commonwealth, and while the officers and members of the committees are well doing gratuitously work that is for the benefit of all; yet to continue requires adequate funds, not for salaries or offices, but for necessary clerical labor, and the different county branch associations, composed of the men most vitally interested in the matter, are urged to realize the fact and take immediate action.

Regarding the informal proposition from the S. P. Co. to create a commission, the committee could take no action, as it was not in tangible shape. Two joint commissioners are well enough if unanimous; but a third is needed. Then, it is a question if their findings would be accepted if contrary to the railroad's wishes or interests. Without giving the matter mature reflection, and with only such knowledge as that afforded by the brief outline of the scheme as placed before the meeting, the idea does not look feasible. It seems to be a move on the part of the company to divert and scatter the main work. It looks more like a surrender than a compromise, and the natural distrust of the company's methods militates against its favorable consideration.

Concentrates.

THE Morning Star Gravel Mining Company has declared dividend No. 54—$3.50 per share.

THE Bonanza Slide Drift Mining Company has levied an assessment of $10 per share, delinquent July 5th.

C. O. PERRY, C. E. Holmes and G. W. Fisher, of this city, have bought the Mount Ophir mine at Chili Junction, for $10,000.

THE proceeds, after expenses are paid, of the Nevada County Miners' Union picnic will go to the State Miners' Association.

THE directors of the Bullion-Beck, Utah, paid a dividend of fifty cents per share on the capital stock, amounting to $50,000, on May 29th.

THE Gila Monster mine, 16 miles north of Phœnix, Arizona, is reported sold to D. Kelsoe, of Atchison, Kansas, for $15,000. A 10-stamp mill is to be built.

NORTHEASTERN Trinity county is again attracting attention. The Humboldt Mining Co. has been reorganized at Eureka, and will engage in active work this season.

THE regular monthly rumor is afloat that the Rothschilds have bought the Anaconda copper mine. The report of the sale of the Old Dominion mine in Arizona is confirmed.

AT Rossland, B. C., there are a thousand men to-day where there were scarcely fifty six months ago, and properties that were sold then for comparatively small prices bring big figures now.

M. W. BREMEN has sold his three mines in Lost Gulch, near Globe, Arizona, to A. O. Brummel and J. B. Brown, of Washington, D. C., for the Kasser Gold M. & M. Co., who will build a 30-stamp mill there.

THE West Consolidated Virginia and California Mining Company has suspended work in their westerly workings on the 1100-foot level of the old Con. Virginia shaft on account of the strong flow of hot water.

THE African Gold Recovery Company (Limited) announce that during April 53,500 ounces of gold have been recovered on the Rand and 9,400 ounces in other districts; total 62,900 ounces. The March total was 62,500 ounces.

THE United States Geological Survey furnishes a report on the coal product of the United States for the year 1894, which shows a decrease of nearly 11,500,000 "short" tons from the product of 1893 and a decrease in value of over $22,250,000.

A DEED was recorded at Phœnix, Arizona, last week, in which F. J. Remers and Frank Prange conveyed all mining claims, machinery, etc., of the Harcuvar Mining Company to the Maricopa Mining Company, the consideration being $700,000.

THE Napa Consolidated Quicksilver Mining Co. will pay its regular quarterly dividend of ten cents per share on July 1st, and an extra dividend of the same amount on that date. The gross earnings for the three months ending June 1st were $65,700, and the expenses were $22,050.

FOR many years the *Bulletin* and *Chronicle* have given a good part of each week's issue to mining news, and of late the *Call* is doing likewise. Such publicity in the daily press is of value to the mining interests of the State, advertising our mineral resources and enlisting public attention.

THE deal between Wallace & Sons, the brass and copper manufacturers of Ansonia, Conn., and W. A. Clark, the wealthy Butte City copper king, who had been negotiating with the firm for several months, is off. The stockholders refused his offer and he declined to make a better one.

THE Yuma *Times* reports that the Cargo Muchacho mine, after years of successful working, closed down last week and all hands were paid off and discharged. The ore body has been exhausted in the levels and stopes and the company decided not to push prospecting any further at present.

FROM three different sources comes simultaneously this week the same question: "Can you tell when and where the copper plate was first introduced?" referring to the California quartz stamp mill. We confess our inability to answer the question. Can any of our readers give the desired information?

A RECENT DECISION says that, in the selection of a newspaper for publication of notice of mineral application, the register, in the exercise of proper discretion, may designate a paper that he regards best for the purpose of giving the greatest publicity to the notice, even though it may not be the paper published nearest the land.

THE manager of the Broken Hill Proprietary reports that for the week ending May 16th 7,320 tons of ore were treated, yielding 537 tons of lead, containing 203,129 ounces of silver; also 1,867 tons treated by amalgamating and leaching plants, producing 21,897 ounces silver. The price of the shares in Melbourne is £2 5s. buyers.

THE seven Comstock companies referred to at length in last Saturday's PRESS have decided to work together in securing 5000 feet of the Brunswick lode at $12.50 per foot, to be prospected from the Comstock tunnel at pro rata expense. Jos. Low is at present examining the ground and will shortly report upon the feasibility of the plan as outlined.

AN item is traveling through the Eastern press that California's gold yield in '94 was $40,000,000. Last January this paper figured it $14,000,000. Later and more extended data placed the aggregate at about one-third of a million less. California still leads the list of gold producing States. It is believed the '95 product will aggregate $16,000,000.

W. D. JAMES was killed by a cave at the Derbec gravel mine, near North Bloomfield, last Saturday. He and his partner were working in an upraise of the drift; they were warned at lunch not to go back again; it is said he made the remark, "If we are to be killed, we may as well eat and die with a full stomach." Returning to their work after lunch, they had scarcely lifted a shovel when the cave occurred.

MENTION was made some weeks ago that E. S. de Golyer, of Salt Lake, Utah, had bought the Gottschalk mine, a mile north of San Andreas, Calaveras county, and that he had begun sinking a three-compartment shaft on the west vein. It is now down 125 feet, and the owner has returned to Salt Lake to organize a company to develop the property, the results fully justifying the necessary expenditure of considerable money. He proposes to put up a forty-stamp mill, and has let contracts for 1200 feet of tunnel. A pipe line of 900 feet will be utilized in furnishing power.

JNO. P. JONES, Jno. W. Mackay, D. O. Mills, Irwin C. Stump and other moneyed men prominent in mining matters are about to form a New York company to promote the exploration and sale of American mining properties. The waning interest in the "Kaffir circus" in London and the renewed interest in gold mines in New York make the present an auspicious time for the organization of a big concern with plenty capital, which, rightly managed, will be of benefit to all.

AT the annual meeting of the stockholders of the Crown Point Mining Company 79,518 shares were voted. James Newlands, A. K. P. Harmon, J. P. Martin, James Newlands Jr. and C. L. McCoy were re-elected trustees. C. L. McCoy was re-elected secretary and W. E. Sharon superintendent. The secretary's financial statement showed a credit of $15,704. The superintendent's annual report shows that during the year they extracted from the 600 and 700-foot level stopes 18,650 tons of gold ore, of which 18,569 tons have been worked, the balance remaining on hand. From this ore was obtained bullion valued at $157,754, calculated at par, from which coin returns of $147,290 were received. The average fineness of the bullion was 574.9 in gold; its value per ounce was $12.42, and the yield per ton in coin $7.90.

THE Supreme Court has before it for decision a case, submitted with abundant evidence and argument last week, which is of unusual interest to prospectors and miners in general. Some time ago Robt. Woodburn agreed with Wm. Berry that he (Berry) was to go to Trinity county and get a quartz mine for him (Woodhurn). He was to pay him "big wages" and expenses in procuring the same, and if the mine so procured was a paying one, Berry was to have a half interest in it. Berry got the Globe mine, near Weaverville, for him; it proved valuable, but Woodhurn backed out and refused to deed Berry one-half of it. Berry sued him at Weaverville and a jury awarded him all he claimed. The court sustained the verdict, modifying it by the judgment that Berry should pay one-half the purchase price of the claim and one-half the cost of working it from the time of purchase to that date, and that Woodhurn should then give him a one-half interest, or Berry could secure a deed to the one-half interest by paying $4000 to Woodhurn. Woodburn appealed, and now the Supreme Court will decide the question, affirming or reversing the lower court.

THE annual statement of the Ontario, Utah, Silver Mining Company for 1894 is received. The Ontario has produced to date, since incorporation in 1877, over 30,000,000 ounces of fine silver; it has paid in dividends ever $13,000,000, and has furnished employment to hundreds of men. During the year the mill reduced 28,500 net tons of ore of an average assay value of 48.14 ounces silver per ton, saving 91 per cent. and producing 1,259,972 ounces of fine silver and 1102 ounces of fine gold. The milling cost on reduction was $7.19 per ton, and the total cost of all operating expenses was $22.72 per ton. There is an increased tonnage and assay value as compared with 1893 and a less per cent saved and a reduction in operating expenses, the total expense of reduction being $2.66 less per ton. After paying all expenses the cash balance has been increased during the year $173,557.88. The report says: "The mine has produced continually, and, with the former price for silver, could have paid dividends with equal regularity. Prior to 1892, the New York quotations averaged about $1 per ounce, and for the past three years it has averaged about 74½ cents, and for the past year 63 cents. This fall in the price of silver represents a loss to the company during the past three years, on 4,279,906 fine ounces silver (the product of the mine for that period) of $1,091,376.05, and for 1894, $497,420.82 on 1,343,291.45 ounces produced."

THE action of the Gold & Silver Extraction Co. of America vs. the Mercur, Utah, G. M. & M. Co., began this week at Salt Lake before Judge Merritt. The plaintiffs state they are the owners of the patents covering the cyanide process of extracting gold and silver from ore and that the defendants are infringing upon their patent; that contracts in September, '91, and kept till August, '93, between plaintiff and defendant were that defendant should pay $1 for each ton of ore it treated by plaintiff's process, and ask that defendants be decreed to account for and pay ever the income or profits derived from the use of the processes in the treatment of ores since August 15, 1893, and be perpetually enjoined from further infringement of plaintiff's patents. The defense deny that royalty can be collected, and claim that plaintiff's complaint is defective in not alleging that the ore contained base metal. It is a matter of common report that since they refused to pay the $1 a ton royalty the Mercur Co. has treated 150,000 tons of ore by the cyanide process. The $150,000 involved is, however, secondary to the main question of general royalty, this being viewed as a test case, and as such is of considerable interest to the mining world, affecting numerous cyanide plants in this country. The question before Judge Merritt is only a preliminary skirmish over the sustaining or overruling of a demurrer.

JUDGE CLEARY, who has been prominent in two recent mining deals, has brought suit against W. A. Nevills, W. H. Martin and J. Ballard. He represents Saunders, Fielding and Boyd, of London, New York and Chicago. Last February the defendants gave Cleary an option till June 1st on the capital stock of the Guild Gold Mining Co., for $1,300,000, comprising the Rawhide mine, the App, the Hitchcock and Heslep, and one or two other valuable gold properties in Tuolumne Co. Of the 100,000 shares, 95,000 were deposited in escrow with Wells, Fargo and considerable experting and inspection of the property ensued, the reports to the London syndicate being favorable. Doing business at such distance is necessarily slow, and the securing of such a sum not a momentary affair, so that when the option expired last Saturday, the deal had not been closed. Cleary saw that it would be impossible to get anything arranged by June 1st and secured a verbal agreement from Nevills to extend the time to July 1st. On Friday of last week Nevills and his partners notified Cleary that they would not extend the option, and the latter secured a restraining order from Judge Seawell preventing them from making any disposition of the property pending the outcome of the suit brought. Cleary recites the circumstances, asks that Wells, Fargo be enjoined from surrendering the deeds and stock, and that Nevills, Martin and Ballard be compelled to make good the agreement of Nevills to extend the option till July 1st, charging that they are trying to evade it, that he and the men he represents are acting in good faith and with all possible expedition, and that he stands ready to pay $50,000 on July 1st, and $1,150,000 on August 1st. In his complaint Judge Cleary, without directly stating it, intimates that W. A. Nevills had agreed to take a bribe of $200,000 from him to defraud his partners, Martin and Ballard, by getting them to agree to a lower price for the property than it was really worth. The defendants in their answer, which was filed last Monday, allege that Cleary offered Nevills a bribe, and also tried to bribe S. M. Shortridge, their attorney. W. A. Nevills says that immediately after the option to June 1st was given, Cleary proposed to him to take a share of the commission, that he seemingly assented, notified his partners, and had them behind a screen unseen witnesses and hearers of the bargain when subsequently made; that an agreement was drawn up in which he, Nevills, was to have $150,000 for himself; that when June 1st approached, Cleary asked for an extension, and offered him $200,000, that is, $50,000 more, for 30 days' more time; that such proposition was agreed to and a paper so drawn; that in his, Nevills, belief, Cleary never intended to pay him, but was trying to use the agreement as a means of blackmail, and that so far as he was concerned he kept his partners thoroughly informed of all Cleary's overtures, intending at the last to punish him for his alleged baseness. Nevills says he has notified Chas. W. Fielding, Cleary's principal, that the option will be renewed if desired, but not through Cleary, and that the $200,000 agreed to be paid to him by the latter must be included in the deal, and that Fielding has practically accepted the proposition. The whole story will receive further ventilation later on. Meanwhile richer ore than ever has been struck on the 600-foot level of shaft No. 2, of the Rawhide mine, which is the storm center of the dispute.

Personal.

THOMAS B. BARBOUR, representing the Risdon Iron Works, is in Salt Lake City.

PROF. GEO. LOWE will shortly begin the publication of a journal devoted to electrical matters.

SUPT. JAMES, of the Uncle Sam mine, and his son, W. M. James, of Kennett, leave next week for Johannesburg, S. A., where they will take charge of one of the Randt gold properties.

D. T. BUCKBEE, who recently resigned the superintendency of the Monte Cristo group of mines, in Washington State, is looking around the Grass Valley district in the interest of Montana capitalists.

Forty-Two Years Ago.

In the issue of May 25 appeared an article on the evolution of the quartz mill, which was illustrated by sectional views of "the premium battery of 1858," and "the model gold mill of '95." Further data and interestiug reminiscences are furnished herewith, and in addition is given an illustration from the original box-wood engraving of the town of Grass Valley, forty-two years ago, which will be of iuterest. to thousands of mining men throughout the world.

The mines in and arouud Grass Valley and Nevada City, Nevada Co., Cal., have been the maiustay of the California mining industry. The names of many of the leading properties are familiar as household words to all old-time Californians, and their varying fortunes are still watched with interest by multitudes of people scattered all over the world. As the scene of the earliest quartz mining the Grass Valley district is always interesting to the mining community, the more so in the matter of comparison of working results then aud uow.

To the scientific study of these mines and the different ore bodies opened up at intervals the world is largely indebted for much of the advancement which has been made in the manner of experting and developing mineral lodes. One of the most active pioneer workers in this important branch of the profession is the veteran Melville Atwood, the well known geologist of this city, whose services in the aid of science have already met with distinguished recognition in Great Britain, where his name has been enrolled as a member of many of the best-known scientific and literary associations. He has been a fellow of the London Geographical Society for over a quarter of a ceutury. Mr. Atwood has spent a lifetime in mining, and since 1852 his fortunes have been identified with the business on the Pacific coast. He originally came here to represent a London compauy, the Agua Fria, to manage their mines iu Mariposa county, but eventually took charge at Grass Valley. The following notes on early mining in Grass Valley district, and the working results of the ores, are supplied by Mr. Atwood, the data in nearly every case being taken from his memoranda:

The first Gold Hill quartz mill in the Grass Valley district was built iu 1851, and was of eighteen stamps. An English company, the Agua Fria, in 1852 purchased a coutrolling interest in the Gold Hill Mining Company, and in 1853 erected a tweuty-one-stamp mill, with Cornish crushers, etc. The engine, boilers, stamps and crushers were constructed by Bolton & Watt. The engine, a low-pressure one, was of the same pattern as those used in the old Beaver, the first steamer that ever doubled Cape Horn. It required very little fuel to run this machinery.

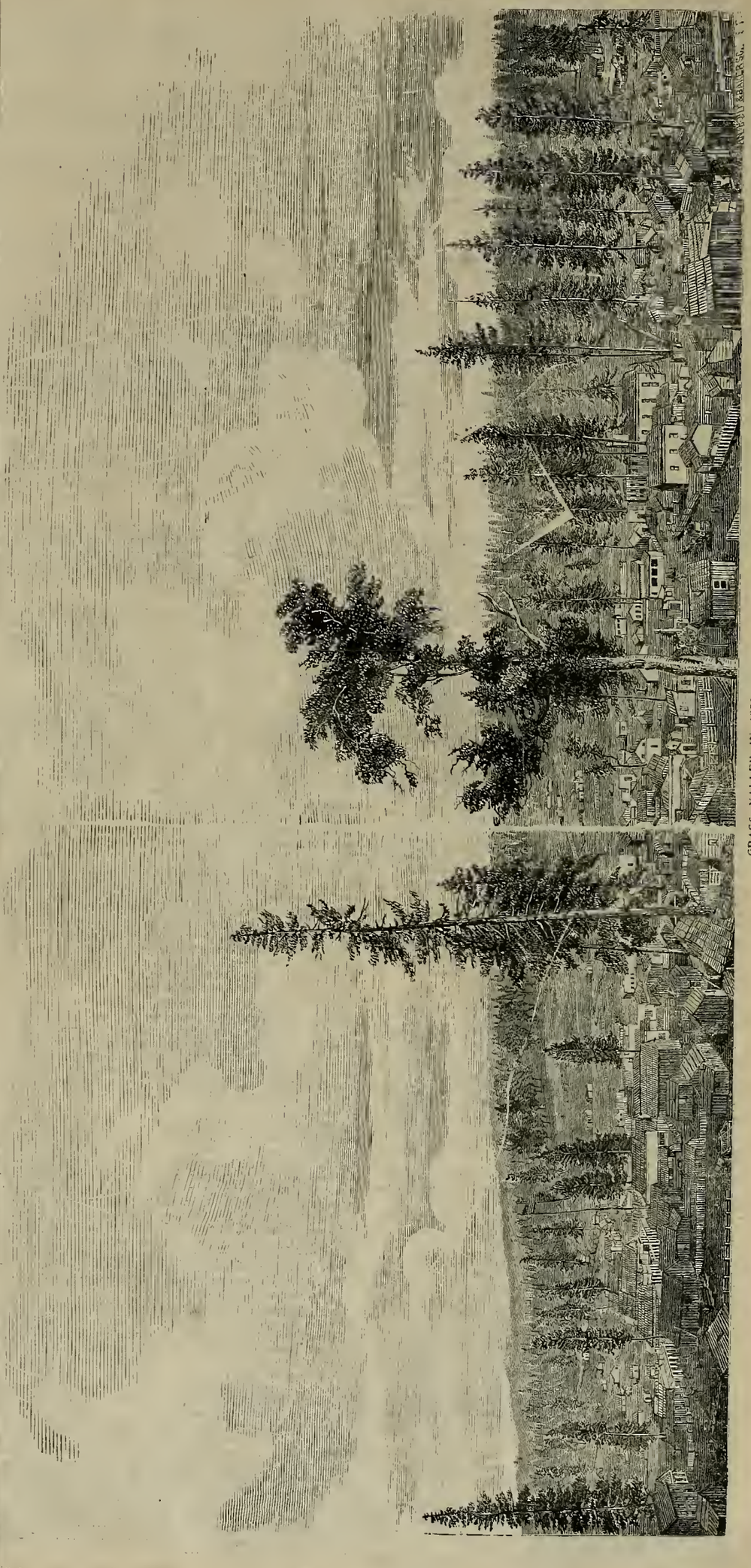
The Agua Fria Compauy also sent out a small sawmill to cut all the necessary lumber, also a cupola furnace to make any castings required. The first shoes aud Cornish pump in the State were cast by it, as well as four Chilean mills. The fire-bricks and Stourbridge fire-clay, to build a furnace for the roasting of pyritic matter, were all imported from England.

The system of milling in vogue then, as described by Mr. Atwood, will iuterest the mine owners of today, iu view of the results attained. The rock was first spalled (*i. e.*, beaten with hammers); theu passed through the Cornish rolls, like the rock breakers now in use, after which it was passed to the stamps. The screens used were puuched copper plates and brass wire, the aperture being about the same as a twenty-four mesh. The pulp from the mortars was then allowed to pass from the blanket trays, of which there were three to each mortar, in three lengths of about five feet each and sixteen inches wide, the angle of which could be raised or lowered by lever to suit the rock being treated.

The blankets were in three-feet lengths. At first bed blankets were used. Afterwards the company got the San Francisco Woolen Mills to make them of coarse wool with the nap only on one side. The pulp was then delivered equally against a board by distributors and made to strike the blankets at right angles, by which means the heavier bodies were retained in the coarse nap. Three sets of trays were used, so that two were always in place, while the third was being washed. The time for washing the blankets was from one-half hour to two hours, according to the richness of the pulp.

The pulp, after passing over the blankets, was run into tye-bundles, drawings of which will be seen in Phillips' "Mining and Metallurgy of Gold and Silver." The pyritic matter collected ou the blankets aud from the tye-bundles was afterwards passed through Atwood's amalgamator, which collected nearly all the free gold. The amalgamator had uuder the three pools of mercury an arrangement so that a jet of steam kept the temperature at about ninety degrees. The pyritic matter was then roasted in a furnace, put up at the time the mill was built. The roasted matter was then amalgamated in a Chilean mill, constructed for the purpose.

The following tabular statement, taken from the



GRASS VALLEY IN 1853.

books of the old Gold Hill Mining Company, shows the results of the milling of custom rock at that mill during the year 1856, which was brought from most of the mines then being worked near Grass Valley:

Mine.	*Tons.*	*Per Ton.*
Missouri Hill	72	$40 00
Missouri Hill	33	23 00
Missouri Hill	20	25 00
Missouri Hill	110	26 00
Missouri Hill	76	25 00
Sebastopol.	27	111 00
Sebastopol.	30	60 00
Sebastopol	21	30 00
Houston Hill	22	60 00
Allison Ranch	21	370 00
Gold Hill	11	117 00
Gold Hill	7	117 00
Gold Hill	226	23 00
Gold Hill	7	63 00
Gold Hill	7	40 00
Gold Hill	19	28 00
Gold Hill	61	40 30
Gold Hill	157	50 00
Osborn Hill	5	60 40
Ophir Hill	57	180 00
Massachusetts Hill	40	28 00
Rose Hill	120	23 00
Ridan Hill	39	28 00

The following results were obtained from the same class of ores worked at the French mill, owned by Messrs. Fricot & Co.:

Mine.	*Tons.*	*Per Ton.*
Ophir	140	$94 43
Sebastopol.	263	39 00
Wisconsin	58	45 12
Rich Hill.	40	34 00
Massachusetts Hill	34	90 00
Massachusetts Hill	90	118 00
Massachusetts Hill	17	140 00
New York Hill.	40	85 70
Mt. Hope	2,000	$55 to 60 00

The State Agricultural Society in 1858 sent several competent experts to examine all the gold quartz mills in California, and, after a thorough investigation, awarded to the twenty-one-stamp mill erected in 1853 the first premium, a gold cup for the best quartz mill in the State, and a silver medal for the best amalgamator and gold-saving washing machine.

The stamps brought out from England were made from forged scrap iron and fitted into wooden stems, and when they were worn out, wrought iron stems with sockets and cast iron shoes were used. The first Cornish pump and Chilean mill were cast by Mr. William Watt at the Gold Hill mill, and Mr. T. Giles, now of Nevada City, cast the sockets and shoes.

In June, 1859, the furnace at the mill was being used for chlorination works, with not very satisfactory results, but the first assay of silver from the Comstock ore was made by Mr. Melville Atwood, which was $876 per ton for gold and $3000 for silver. The piece of rock from which this assay was made was brought from the Comstock by Mr. B. A. Harrison and taken from the croppings of the Ophir lode.

The Agua Fria Company, which was originally formed to work a number of mines in the old Fremont grant in Mariposa county, served to create in rather strange manner one of the landmarks on the Sacramento river. Mr. Atwood is again authority for the story. It appears that the company sent out to California a number of engines and supplies of all kinds required in mining. When they arrived at San Francisco there was no warehouse to put them into, so they purchased an American bark, the Charleston, and stored them in it. The bark was towed up to Sacramento in February, 1853, and, after discharging the machinery and supplies for the Grass Valley mines, remained for some time there; she was then ordered back to San Francisco. The gentleman in charge thought he would pay all expenses by taking a cargo of cordwood from the Ironside ranch.

Owing to the upper works having been exposed to the sun while lying at Sacramento, when she reached deep water the bark leaked so badly that she sank and nearly everything was lost. Any property recovered from the wreck cost nearly as much as the original price paid for it. The vessel finally had to be blown up, and made what was afterward called the "Hog's Back" on the Sacramento river.

The original incorporators of the Agua Fria Company have passed away long ago, and the mines they owned have passed through the hands of many proprietors.

The cut is furnished by Mr. W. B. Ewer, of the MINING AND SCIENTIFIC PRESS, another honored pioneer, who started the first newspaper ever published in Nevada county.

RAYMOND GRANITE QUARRY, MADERA COUNTY.—*See page 357.*

Recent Decisions.

The Supreme Court of the United States has, in case of Joel Parker vs. Frank O. Taylor, held that where, on the records of the local land office, there is an existing claim on the part of an individual to land within a railroad grant under the homestead or preemption laws, which have been recognized by the officers of the government and has not been canceled, the tract is excepted from the operations of the grant.

Mineral.—The mineral value of a vein is not established by an ordinary assay certificate.

Oil land may be located under the mineral laws. Proof that neighboring lands contain oil is not sufficient to defeat an entry of land returned as agricultural.

Mineral locations prior to survey are not in conflict with reserved school sections.

A failure to comply with local regulations is a matter for protest or adverse suit.

Mineral land will not pass under a townsite patent.

Mineral land must be shown as a present fact.

Best to Advertise in.

A man who subscribes for a trade paper does so, not only because he is alive to the interests of his trade in general, but because he expects to find in it—and generally does—information and suggestions of value in the conduct of his own business. Such a man reads his paper from end to end, advertisements and all, commenting as he goes along. Many things are jotted down in his memo. pad for every day use, as well as inquiring further into on his first visit to market. And as it is necessary for a man to be wideawake nowadays in order to succeed in business, these are the men who subscribe for their trade journal, and are the advertisers' best patrons. They cannot afford to pass anything which promises help or suggests additional profits. Hence, the trade journal is the best medium for advertising things which concern the business man.—Newspaperdom.

A MAN who enlists in the United States army loses his right to appeal to the civil courts against the decisions of military tribunals by which he may have been tried. This is the decision of the United States Supreme Court in the case of a soldier who was tried by court martial, and who sought the civil courts for relief. The case has aroused much interest among military men, both officers and privates. It is the general opinion that the denial of appeal to the civil courts is the only means of maintaining any discipline.

Mining Under the Sea.

At Betallack, near Cape Cornwall, a striking example is seen of man's boldness in searching for wealth and his skill in securing it. Betallack is a bold headland, composed of huge masses of hornblende, masked by walls of slate, against which the Atlantic surges are constantly dashing. But the persevering efforts of man have at this point been more powerful than those of nature. Gloomy precipices of slate, which unnumbered ages of sea storms have been unable to displace, are here cut in twain by the miner, whose complicated machinery clings to the cliff at places where it would seem almost impossible for an engine to be fixed. Powerful steam engines, stamp mills, and all the heavy machinery required in modern mining are perched on what at first sight seem inaccessible situations, so that from a distance they look as if growing out of the crags. All is noise and bustle, which contrast strangely with the placidity of the seaward view. "Kibbles" descend fathoms beneath the sea, and ascend again with copper or tin ores, which are wheeled away to larger heaps, where women, boys and girls separate various qualities with the systematic industry of workers in a factory. Everbody and everything—rocks, platforms and paths—are smeared with the prevailing red hue derived from a slight mixture of iron with copper or tin ores, and then the very muddy stream flowing from the stamp mill to the sea has imparted to the beach, the breakers and the foam the same rubicund tinge. If ore is coming up plentifully and of good quality, everybody is pleased, and far down in the gloomy depths of the mine, which Cornish legends people with spirits, the news that a new "bunch" of copper has been struck, or that the old lode is growing richer, fills the workers with professional joy. As the visitor creeps along the passages into which the light of day has never entered, he hears comparatively little, until, having become accustomed to the darkness barely illuminated by the flicker of lamps, he dimly distinguishes the stalwart gnomes at work. Coming from the upper world amid the din of heavy stamps and measured gush of pumps, the clang of machinery above and the surge of the sea below, the rattle of wagons on tramways, and the crowds of men and boys climbing up and down paths which seem too steep for a goat, the modified silence of the level strike sone as unnatural. In places, however, the guides may ask the visitor to listen to a curious sound. It is the booming of the waves above, and the grating of the stones on the sea bottom. Then he is told, to give him courage, that in some of the recesses of the first level the ore has been cut away until a roof not more than six or eight feet thick has been left. First worked on the face of the cliffs only, the mines descended, level by level, until the excavations extended for more than six fathoms under the sea, and for long distances inland, while the greatest depth to which it had been sunk is about 2000 feet.

THE following recipe for artificial stone is given by *Diamant:* Four parts of finely powdered glass is stirred in warm water containing a little hydrofluoric acid for a couple of hours, then nine parts sand and five parts caustic soda are added and the whole thoroughly mixed and poured into molds. After two days, the blocks are taken out of the molds, dried for three days in open air and then subjected to the influence of a one per cent solution of fluoride of sodium for ten days. The stones are washed off and are then ready for use.

ASBESTOS PACKING for valve stems and similar purposes is much improved for use by oiling it well with cylinder oil before putting it into place.

Compressed Air versus Electricity.

To the Editor:—The *Pacific Coast Electrician* of May, 1895, prints an article entitled, "Compressed Air versus Electric Power Plants for Mining Purposes," written by Mr. A. M. Hunt. This article analyzes in detail an article by Mr. E. A. Rix, printed in the Mining and Scientific Press of May 18, 1895, entitled, "Notes on Recent Compressed Air Plants."

As Mr. Hunt suggests, Mr. Rix wrote this article from the standpoint of a special advocate of compressed air machinery, but dealing merely with current news, and it was not aimed at a scientific discussion of compressed air versus electricity. Mr. Rix does not profess to be an electrical engineer, and, as Mr. Hunt's observations clearly indicate, he is not familiar with recent developments in compressed air engineering; therefore we think the public might find a discussion between us more interesting if we confined ourselves individually to our own specialties. We therefore suggest the following problem to Mr. Hunt, with the request that he publish the calculations and estimates for an electrical transmission at his earliest convenience. We will follow with a compressed air transmission, covering the same requirements. The problem is as follows:

There is a mine, of magnitude, which has outgrown its steam plant and desires to bring power from a source four miles distant, over an entirely feasible and accessible line. The source of power may be either water or fuel, and the cost of either the water or the fuel is one cent per horse power per hour. There would be required at the mine the following motors, either air or electrical:

One motor delivering 100 brake H. P. to a hoisting apparatus.

One motor delivering 100 brake H. P. to a stamp mill.

One motor delivering 125 brake H. P. to a Cornish pump.

One motor on the 1500-foot level to deliver 25 brake H. P. to an auxiliary pump.

One motor on the 1500-foot level to deliver 25 brake H. P. to a winze hoist.

There will also be required 1500 cubic feet of free air per minute, compressed to 80 lbs., for running rock drills and veutilatiug purposes; also electricity for 250 incandescent lights.

Required: The total brake-horse power to he delivered from the shaft of the prime motor to accomplish this result; also the cost of all the machinery and appliances included between the prime motor and the machinery to be driven at the mine.

These requiremcnts are very similar to those at the Maryland mine, Grass Valley, and therefore cannot be considered unique.

We would suggest that the cost of transmission and of the differeut generators and motors and of the erection, etc., be fully itemized, and let us say that the mine is located at Grass Valley.

Calculations are to be given full enough for comprehension and the efficiencies throughout the system plainly shown and reference given to authorities or tests, where possible.

Mr. Hunt may consider in this problem that the introduction of compressed air for running rock drills is an unnecessary requirement, inasmuch as it might be possible to run rock drills by electricity. We have taken the precaution in this matter to ask the General Electric Co. and the Electrical Engineering Co., the only two concerns here who have been interested in electric rock drills, regarding the status of these drills at preseut in the market. They permit us to state as follows: The General Electric Co. state that they are not in a position to furnish these drills at present. The Electrical Engineering Co. state that they have expended thousands of dollars trying to perfect an electrical rock drill, and the result has been an absolute failure. Upon inquiry we do not find that there is a mine in the State using electric rock drills; consequently, inasmuch as we are considering a mining transmission, we think the requirements stated in the problem are proper.

It is understood, of course, that the efficiency of whatever electrical machinery we may use in our transmission, or whatever pneumatic machinery Mr. Hunt may use in his electrical transmission, shall be calculated at the per cent which we are perfectly satisfied to allow.

Referring to Mr. Hunt's article, where he speaks of slide valve engine economies, he has evidently misunderstood Mr. Rix's meaning, for the latter referred to plain side valve engiues requiring from thirty to sixty pounds of water per horse power hour, in comparison with the various Corliss types using from fourtcen to twenty-eight pounds. Mr. Rix is perfectly aware that there are automatic cut-off engine builders who make guarantees equal to the Corliss, and he is also aware, from an article published in *Industry* of May, 1895, that Mr. Parsons' steam turbines are delivering a killowatt on a consumption of fifteen pounds of water per hour, which is equivalent to between eleven aud twelve pounds of water per horse power hour—a result as yet impossible with reciprocating engiues. Yet these high rotative types are not adapted to compressing air, and consequently he spoke of the Corliss type only as exemplifying high economy in connection with air compressors.

Speaking of compressed air transmissions, we note in the Mining and Scientific Press of last week that a large engineering concern in the East had contracted with the Delaware, Lackawanna & Western Railroad to furnish a compound air compressing plant, driven by cross compound condensing Corliss engines, transmitting air at 110 pounds to the square inch for 3800 feet, to actuate with a guaranteed efficiency of ninety per cent a compound pneumatic engine, which in turn drives two differential pumps. This ninety per cent evidently is the ratio between the indicated horse power of the steam engines which drive the air compressors and the indicated horse power in the air motors, and if the results fulfill the guarantee, what is there in the shape of a transmission that can do any better?

Yours very truly,
Edward A. Rix,
A. E. Chodzko,
Compressed Air Engineers.
226 Market St., San Francisco, June 6, '95.

Increased Production of Gold.

The Director of the Mint has just issued his estimate of the production of the gold and silver mines of the United States. The statistics presented by him will be received with special interest, in view of the discussion upon the monetary question which has been sprung recently, and which may be said to be now in full swing. The amount of gold produced and its coining value are given in the following table:

AMOUNT AND VALUE OF GOLD PRODUCTION.

State or Territory.	*Fine ounces.*	*Value.*
Alaska	53,888	$ 1,113,330
Arizona	86,324	1,784,475
California	656,468	13,570 397
Colorado	459,152	9,491,514
Georgia	4,726	97,756
Idaho	100,682	2,081,281
Michigan	2,150	44,444
Montana	176.637	3,651,410
Nevada	55,042	1,137,819
New Mexico	27,465	567,751
North Carolina	2,254	46,504
Oregon	60,792	1,422,056
South Carolina	4,735	97,830
South Dakota	159,594	3,290,100
Utah	41,991	868,031
Washington	9,438	195,100
Ala., Md., Tenn., Va., Vt., Wyoming	1,495	30,903
Totals	1,910,815	$39,500,000

The amount and value of the silver production of the mines of the country are given in the following table:

AMOUNT AND VALUE OF SILVER PRODUCTION.

States or Territories.	*Fine ounces.*	*Coining value. (measured in gold.)*
Alaska	22,261	$28,782
Arizona	1,147,304	1,483,254
California	717,368	927,506
Colorado	23,281,399	30,101,303
Georgia	325	420
Idaho	3,288,548	4,251,860
Michigan	35,122	45,410
Montana	12,820,081	16,575,458
Nevada	1,035,151	1,338,377
New Mexico	632,183	817,368
North Carolina	352	455
Oregon	26,171	33,837
South Carolina	305	394
South Dakota	58,973	76,248
Texas	429,314	555,073
Utah	5,891,901	7,617,812
Washington	113,160	146,308
Ala., Md., Tenn., Va., Vt., Wyoming	182	235
Totals	49,500,000	$64,000,000

The figures given, says *Bradstreet's*, present at the outset one notable point of interest. It is this—that the production of gold in 1894 was the largest for any year since 1878, being worth about $3,500,000 more than that for the preceding year. The production of silver showed a decrease of about $10,500,000 as compared with the preceding year. In short, while silver production has been falling off, gold production has been increasing—a fact which goes to show the groundless nature of the fear that the supply of gold will sink below the normal requirements of commerce.

California and Colorado hold the lead as producers of the precious metals. California led in gold production with a total quantity of 656,468 ounces and a value of $13,570,397. Colorado comes next with a total quantity of 459,152 ounces, valued at $9,491,514. Montana, South Dakota, Idaho and Arizona followed in the order named. In silver production Colorado led all the other States, turning out 23,281,399 fine ounces of the coining value, measured in gold, of $30,101,203. Montana came next with 12,820,081 ounces of the coinage value of $16,575,458. Utah came next with 5,891,901 fine ouuces of the coining value of $7,617,812; Idaho next with 3,288,548 ounces of the coining value of $4,251,860; Arizona next with 1,147,204 fine ounces of the coining value of $1,483,254 and Nevada next with 1,035,151 fine ounces of the coining value of $1,338,377. At the average price of silver for the calendar year 1894—$0.635 per ounce—the commercial value of the silver product of the mines of the United States was $31,432,500.

The figures for the gold and silver production of the world are incomplete thus far, but so far as received they show an increase in the production of gold over 1893 of about $21,000,000, the largest increases being in Africa, which has $9,600,000, and Australia $6,000,000, followed by the United States with an increase of $3,950,000. Australia leads the list of gold-producing countries for 1894 with a production of $41,000,000, the United States taking second place. The product of silver in the world, it is estimated, will be from 145,000,000 to 150,000,000 ounces for the calendar year 1894. The heaviest falling off in the production is in the United States, followed by Australia, Mexico showing a gain of 2,700,000 ounces. Mexico shows a gain in gold production of about $1,500,000.

Coast Industrial Notes.

—It is proposed to bond Oakland for $3,000,000 at 4 per cent for forty years for municipal improvement purposes.

—The San Francisco Bridge Co. has a contract to furnish a 24-mile pipe line for the Portland, Or., water works; the price is $460,000.

—The Joshua Hendy Machine Works is sending a 20-stamp mill to the Mammoth mine, Tuolumne Co., and a similar one to Congress, Arizona.

—C. B. Hanson, resident representative of the E. P. Allis Co. of Milwaukee, Wis., has moved his headquarters tbis week to No. 9 Fremont St.

—The Union Gas Engine Co. is finishing four engines—a 20 H. P. for a fruit schooner, a 35 H. P. for the Wilmington Development Co. and two 20 H. P. for bay schooners.

—Francis-Smith & Co. have a contract with the Horsefly G. M. Co. of Cariboo, B. C., for steel pipe sufficient to thoroughly work the company's 360 acres of placer ground.

—It is reported at Colon that the new French company, which has been pushing the work along the route of the Panama canal, is trying to sell the canal to an American syndicate.

—The Consolidated Water Co., of San Diego, comprising the San Diego Flume Co. and the San Diego Water Co., has placed $1,200,000 of its $2,000,000 5 per cent. bonds in English hands.

—Two 600-H. P. electric generators and a 1200-H. P. triple-expausion engine form a part of the new equipment for the Market St. Ry. Co., of this city, under the direction of the Union Iron Works.

—Moran Bros., of Seattle, Wash., have built and delivered three 42-inch centrifugal pumps and upright engines for the Government dry dock at Port Orchard. They bave a pumping capacity of 110,000 gallons per minute.

—The Manufacturers' Association have made appropriate showing to the powers that be regarding the roof of the new union depot that it should be of fine California slate, than which there is none better, rather than imported galvanized iron.

—The Willapa, Wash., *Pilot* states that iron works will be put in New Ilwaco for the manufacture of iron from the great quantities of black sand there. It is said that 1400 pounds of iron can be secured from a ton of the sand by a new chemical process.

—The San Francisco and San Joaquin Valley Railway has paid J. F. Merrill $42,000, the third installment of the payment for the rails ordered. There are now afloat on their way bere 5,500 tons of rails. It is thought that the new road will begin to lay track by July 1st.

—The two sets of hoisting engines building at the Union Iron Works for the Anaconda copper mines attract considerable attention. The greatest mines of their kind in the world naturally require the most powerful hoisting machinery, and the plant now heing constructed is planned to meet every requirement.

—A big wheat deal was consummated last Monday by the payment to the special administrator of the Fair estate of $3,053,200 for 179,600 tons of wheat at $17 per ton. George W. McNear took 60,050 tons; Eppinger & Co., 57,450 tons; Balfour, Guthrie & Co., 50,050 tons; and Blum, Baldwin & Girvin, 12,500 tons.

—The Pacific Coast Borax Co. is now producing that article from deep, rocky stratifications of borate of lime. Thirty years have made a wonderful difference in the product and price. In '64 the output was 25,000 pounds, New York wholesale price 40c; in '94 the output was nearly 13,000,000 pounds, New York wholesale price 7c.

—The San Francisco Gas Light Co. has finally decided to put into practical shape its long-cherished project of erecting an electric plant to furnish light and power. Pres't J. B. Crockett says the cost will be over $2,000,000, and the outfit will be a California product as far as possible. The probable location will be at Tehama and Fifth streets.

—The California Telephone and Construction Co. announce their ability and intention to establish telephone lines in Sacramento, San Jose, Los Angeles, Fresno, Santa Cruz, Placerville, Oakland and Stockton, and say that they will cut rates so that the telephones now costing $4 and $5 will be had at $2.50 per month, and residence telephones for $1.50.

—The California Wire Works has a $75,000 contract to put in four and one-half miles of tramway from Nelson, B. C., to the Silver King mine. The work is to be finished Sept. 30, '95. The carrying capacity of the tramway, when finished, will be 100 tons of ore every ten hours, which will be delivered at the depot of the Nelson & Fort Shepard Railway.

—Macaroni is made of wheat. We have so much wheat that we bave been feeding it to the American hog. But in spite of this we bought last year over $3,000,000 worth of macaroni from a single district in Italy. It gave work to hundreds of men in that district. But why should the work not have been done in America from American wheat by American workmen for American wages?

—*Wood and Iron* reports the total receipts of lumber for May to be 25,506,746 feet, as against 33,415,436 for May, 1894, a falling off of 7,908,690 feet. The receipts of pine and spruce in May, 1894, were 23,893,102 feet, and in May of this year 15,836,419, a falling off of 8,056,683 feet. Humboldt county increased a small amount, as in May, 1894, she is credited with 2,687,291, and in May, 1895, with 3,270,235, an increase of 582,944 feet. Mendocino in May, 1894, had 6,242,043 feet, as against 5,857,102 in May, 1895, a falling off of 384,941 feet.

—The June number of the Consular reports on "The Oriental Market for Dairy Products and Fruits" is received. Consul Read, at Tien-tsin, says the markets which exist among the foreign residents are supplied by California, a very small amount of European products being supplied. The Consul at Bombay says that California canned fruits and preserves are considered the best in the market and are by far the cheapest. Consul Smithers, at Osaka and Hiogo, says a great amount of butter is shipped yearly from California in tubs, and that there is a great demand for it because of its purity. A large quantity of preserved and dried fruit, he says, was imported last year from California, dried prunes and apricots being sold hy all the principal grocers, and being in much favor, particularly the latter. Consul-General Barrett, at Siam, says there is a great market for the products, not only of California, Oregon and Washington, but of all the United States. Nearly all the wheat flour, says Consul-General Pratt, at Singapore, comes originally from San Francisco, but the bulk of it is purchased for the Straits market at Hongkong. Over 900 tons were imported in 1893. The Consul at Auckland reports that the total quantity of canned goods imported last year was nearly 900 packages, of which quantity the United States contributed over three-fourths. All the dried fruits, says the Consul, come from California, and these products are used exclusively.

Scientific Progress.

Scientific Food Preparation.

The United States Department of Agriculture could not have been in better business than it was when it caused to be prepared and circulated a bulletin on the subject of food preparation. Our enthusiastic poet statistician, Edward Atkinson, in this bulletin skips joyously to the fore with his Aladdin oven and his oil lamp heater and cooker, enabling a poor man to prepare a dinner fit for the gods at an outlay of a few cents. Atkinson's part of the work shows what every cook who has any sense already knew—that in order to get the best results most kinds of food must be subjected to a moderate heat a very long time instead of a fierce shriveling heat for a short time. But very few cooks have any sense in this respect. The pamphlet contains illustrations of cooking tables and boxes that prepare delicious food with the heat only of a little kerosene lamp.

Mrs. Ellen H. Richards furnishes to the pamphlet what, if one were speaking of live-stock feeding, he would call a "balanced ration." And, indeed, no living creature needs a balanced ration more than civilized man does all over the world to-day.

The proper food to keep a human being in health must contain so much carhohydrates or starchy matter. We all knew that before, but the trouble was with the scientific that in their eagerness to lug in this and other fine big words they never told us in what foods we could find our carhohydrates. This Mrs. Richards does. Heat is wanted, and for this purpose fats and oils are necessary. Muscle-building food is wanted too. The food for this purpose contains much "protein," which is the name given to the muscle-building nitrogenous compounds.

Mrs. Richards gives the "balanced ration," which, in the latest scientific view, furnishes all these substances to one person for a week. Her table is as follows, not counting drinks, such as milk, cocoa, coffee, etc.:

	As bought, pounds	Nitrogenous substances, pounds	Fats, pounds	Carbohydrates, pounds
Meat or meat substitutes	3	.40	.20	....
Flour and grains	5	.60	.05	3.50
Butter	0.8	.....	.70	....
Sugar	1	.....	....	.90
Vegetables, including potatoes	5	.06	.12	.60
Fruits	3	.01	....	.20
Total		17.8 1.07	1.07	5.20

The dish that comes nearest to being wholly digested is one made of cornmeal and cheese cooked together. Ninety-three per cent of it is digested. In a dish made up of pea flour cooked with milk, butter and eggs 92 per cent is digested.

Nearly Six Miles Above the Earth in a Balloon.

A record-breaking voyage made hy Dr. A. Berson in the halloon ship "Phœnix" is described in the *Journal of Aeronautics*. The halloon started December 4th from Stuttgart, Germany. It was charged with 2000 meters of hydrogen gas, and amply supplied with instruments for registering wind velocities, temperature and harometric pressures. In a quarter of an hour after the start the halloon had risen to 2000 meters (6500 feet), and in an hour to 5000 meters or 16,000 feet, the thermometer registering 18° C. below zero (0° F.). In less than two hours the hold aeronaut was carried to 26,000 feet, or to au elevation exceeding all mountain summits, with the exception of the loftiest of the Himalayas. The thermometer at this point marked —39° C. (—38° F.), or very nearly the lowest that had been recorded on any mountain top (the winter temperature of the summit of Mount Ararat, as reported hy General Venukof). Neither the rarified atmosphere nor the cold seems to have materially interfered with the intellectual processes of the acronaut, who, however, was forced to a close communion with the oxygen hags. When ceasing for a few seconds to hreathe from these hags, Dr. Berson felt dizzy and dangerously weak, hut only once dip his eyes close against himself. In two and a half hours after the start the adventurous scientist reached the highest point of his journey, 9150 meters (30,012 feet), an elevation almost exactly 1000 feet above the summit of Mount Everest. At this prodigious height, where the harometer registered an atmospheric pressure of only 231 millimeters, or 9.09 inches, careful readings of the instruments were still made, and the condition of the observer was such that seemingly he might have ascended much farther. The temperature in greatly attenuated atmosphere was —47.9° C. (—54° F.). For a full hour after the "highest" was reached, two of Dr. Berson's fingers remained frozen, hut heyond this comparatively little discomfort was experieuced. The descent was made in slow calculated curves, with final arrival on a stuhble-field at Schoenwald, near Keil. Among the interesting results of this atmospheric exploration were the determination of humidity in the highest zones, the snow-flake structure of cirrus clouds, a tremeudous increase of wind velocity with the ascent, and the great lowering of winter temperatures hetween 5000 and 30,000 feet.

Mechanical Progress.

Gas Motor Street Cars in Germany.

Outwardly, the appearance of the cars is precisely similar to that of an ordinary douhle-decked horse car, having stairways from each platform to the seats on the roof. All the machinery is inclosed and coucealed from sight; there is no smell of gas, uo noticeahle heat from the engine, and no undue noise or jar wheu the car is stopped or set in motion. The motor is a double-cylinder gas engine of the Otto model, placed under the seat at oue side of the car, and reached, for purposes of oiling, cleaning or repairs, hy doors which form panels iu the outer wall of the car. When closed, they arc not noticeahle. The gas charge is ignited at each stroke hy an electric spark from a small hattery located in the engine space, so that the car is put into or out of service hy turning a knoh which opens or closes the battery circuit.

The engine is kept in continuous motion while the car is in service, and the whole is managed hy the driver on the front platform.

The gas supply is carried in three cylindrical reservoirs of boiler iron, ahout ten inches in diameter, two of which are hung trausversely under the floor at each end of the car, while the third is placed heneath the seat at the side opposite the engine. The three reservoirs weigh, together, about 550 pounds, and contain 33.5 cuhic feet of gas, compressed to a pressure of eight atmospheres hy means of an ordinary force pump at the end supply station.

A fourth cylindrical reservoir, containing water for cooling the engine cylinders, is placed heneath the douhle seat along the middle of the deck roof, whence the cool water descends and the warm ascends automatically through concealed copper tuhes, so effectively that the water, heing continually cooled in the exposed reservoir, is used over and over again, aud keeps the cylinders down to the requisite temperature. The ordinary car is equipped with a gas engine of nine horse power and carries thirty-six passengers, viz., fourteen seated inside and twelve on deck, with platform standing room for ten more. The larger cars, capable of hauling a trailer during hours of heavier traffic, have twelve horse-power engiues.—Frank H. Mason in Cassier's Magazine for June.

A New "Natural" Method of Wood-Preserving.

Hitherto, the seasoners of wood have relied almost entirely on the extraction of the sap, either hy the natural process of dessication by time aud exposure to the air, or by some artificial process, such as kiln-drying, steamiug, washing, etc. In the curing of timber by the extraction of the sap, a great proportion of the material is depreciated by reason of sun-shakes and cracks, or hy warping, twisting, shrinking and other similar evils. To these objectious may be added many others of a serious nature from a comercial point of view, such as waste of time iu seasoning, necessity to hold large stocks, unproductive outlay of capital, loss of interest, rent, taxes and insurance, risk of destruction, deterioration in quality, expense of priming and filling, shrinkiug of knots and liahilitiy to rot and decay. It is proposed to take a short cut of all this costly tangle aud trouble by simply emulating nature, aud retaining within wood its sap or "life-blood." This, Colonel Haskins, the inventor of the new "natural" wood-preserving process, maintaius, is the only true principal of wood-preservation. The sap should be treated so that the whole of its life-preserving properties are retained and solidified within the substance itself. The sap of wood contains large proportions of certain alhuminous, glutinous, resinous aud olcagiuous compounds in a state of solutiou, and it is of these compounds that nature, iu the growth of the tree, by her laws of heat and pressure, gradually creates the hard, sound, fibrous portion of the wood. The new process is to take the wood in its green state and so treat it with air pressure aud great heat that the various compounds in the sap are distilled and retained within the wood, without losing their antiseptic and preservative properties. The various essential compounds become coagulated in the pores and impregnate the whole suhstance. The soluhle sap becomes insoluhle, binding the fibers, and forming a homogeneous mass incapable of absorhing moisture, impervious to atmospheric change, unshrinkahle, easily worked and practically indestructihle. Thus the process clinches in a few hours what nature has taken years to effect.

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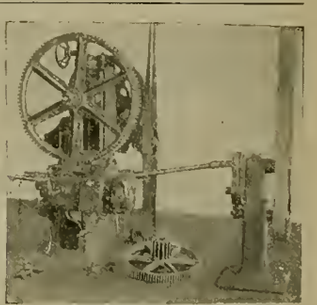

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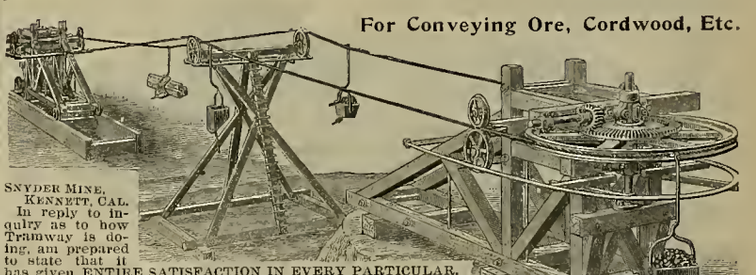

SNYDER MINE, KENNETT, CAL. In reply to inquiry as to how Tramway is doing, am prepared to state that it has given ENTIRE SATISFACTION IN EVERY PARTICULAR.
JUDKINS TRAMWAY CO., POMEROY, WASH. It will give us great pleasure to recommend your Ropeway and your Company as well to any persons who may be thinking of erecting Ropeways.
SAN ANDREAS, DURANGO, MEXICO, March, 20, 1894. I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation.
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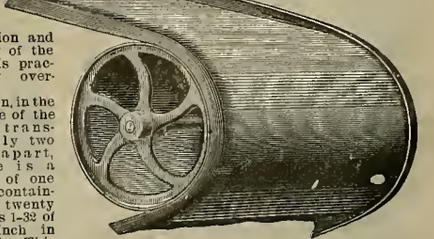
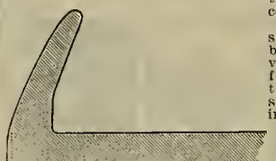
Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.





H. G. BLASDEL, JR., Manager,
419 California Street, Haywards Building.....San Francisco.

Electrical Progress.

Will Ten Volts Kill?

An important issue has been raised by a correspondent in the colnmns of a contemporary. One of the laborers in a mine was killed by an electric shock received while handling an electric mining machine, notwithstanding the fact that the electromotive force on the circuit did not exceed 280 volts. The yonng man was strong and well built, and a post mortem examination by physicians showed that the brain and heart, and indeed the whole body, were sonnd, and there were no marks to indicate the cause of death. Richard Lamb, whose pioneer work in electrical logging is familiar, states that too much publicity cannot be given to the fact that even 110 volts will kill, if applied to a bleeding sore, and allowed to remain a few seconds. The fact that 110 volts does not paralyze the nerves, and that therefore the contact can almost invariably be withdrawn at once, is the reason why there arc so few records of death, if any, by that voltage. With 280 volts in contact with a bleediug sore upon the hand, a person would be killed almost instantly. Blood is a good conductor of electricity, and the current would be transmitted at once to the heart. For this reason, Mr. Lamb requires all the men operating his logging and electric canal boat towing cableways to wear rubber gloves to prevent the possibility of contact with a sore, although he uses only 220 volts. Mr. Lamb says he was assnred by Nikola Tesla that ten volts applied to a bleeding sore on the hand would pnt a man to sleep. Another correspondent believes that the laborer died from fright, and relates how a party of persons having no knowledge of electrical apparatus visited his laboratory to experience the novelty of receiving a static discharge. A harmless shock was administered to each. Where it was unexpected the persons nearly swooned from fright, while those expecting it made not the slightest demonstration. Those so badly frightened at first received afterward a much greater discharge without flinching. One lady picked up a pair of carbons carrying 276 volts, and, after holding them for a while, threw them down with an exclamation of impatience, but without being impressed with the heaviness of the shock.

The Powerful Fire Island Light.

Work on the new electric lamp for the Fire Island light has progressed so far that it is expected that it will be lighted for the first time on July 1.

The new light will be the most powerful coastline illnminator in the world, and the reflection of its five-second flashes on the sky will be observable at a distance of twenty-five miles out to sea,

The light will be 50,000,000-candle power, and this will be increased by the lens to 250,000,000-candle power.

Thc lens was made in France, and is what is termed a bivalve lens, being in two halves, like the shells of an oyster. There is sufficient space between the convex halves of the lens to admit the body of a man. This is necessary, in order that the carbons and other apparatus between the halves of the leus can be renewed and repaired.

The big lens, with all the mechanism supporting it, rests in a big trongh filled with mercury, and it is so arranged that it revolves without friction.

The plant for operating the light and snpplying the electric current is in duplicate, so that a break-down of any part of the machinery will not shut off the rays of this maritime safeguard.

Galvanic Battery Efficiencies.

Some recent publications and other intimations indicate that, with the general revival of business, there are likely to be bronght before the public various schemes in which electric energy, derived from galvanic batteries, will be relied upon as the source of power. In view of this, an article on the above subject, contributed to *Cassier's Magazine* for June by Dr. Henry Morton, is of current interest. Dr. Morton presents a number of calculations pointing to the conclusion that, in the best forms of battery, an allowance of one horse power for each pound of zinc consumed per honr would be a liberal one, if something is allowed, as it must be, for the resistance, local action, etc. The entire energy of the reaction between the zinc and dilute acid in a battery is 3006 British thermal nuits. This would represent 2,320,632 foot-pounds, or 70.62 horse power for one minnte, or 1.17, say 1¼, horse power for one hour, and this would be an absolnte maximnm which conld never be reached, far less exceeded.

Of course, if we conld nse some other and more efficient reaction than that between zinc and sulphuric acid, some gaiu might be secured, but nothing of that sort has ever been accomplished, nor from what is known of the combining or thermal eqnivalents of the available elements, is much to be expected in that line. At all events, we may well accept this as a certain fact, that in any known form of galvanic battery the round figure of a ponnd of zinc per horse power per honr is an outside figure for efficiency, and when any one asserts that more than this has been secured, there is certainly some mistake or frand.

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GEORGE P. HARRIS

Will confer a favor on the undersigned by writing the desired information to the address given below. Mr. Harris left Albany three or four years ago for Colorado, and a letter of inquiry to his brother elicited the information that his address was Trinity Centre, Trinity Co., Cal., but a letter addressed to him there was returned marked "uncalled for." E. J LANNING, Albany, Oregon.

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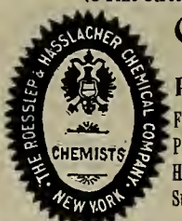

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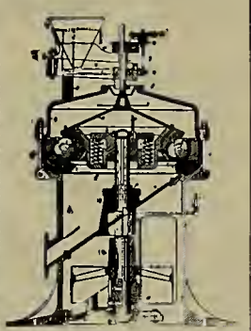

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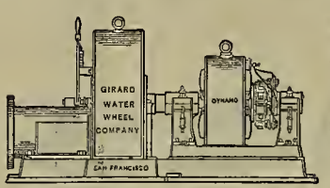

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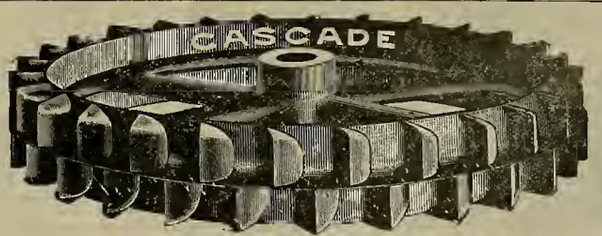

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AN AGREEMENT OF SALE.—*Republican:* The agreement for the sale of the Bellwether was filed for record this week. The agreement provides that the purchase price shall be $110,000 for sixty-nine acres of mining ground; said amount to be paid by fifteen per cent of the gross output of a mill of a crushing capacity of not less than 100 tons per day. From the time of taking possession of the property and the equipment and starting of the mill the party of the second part, Joseph Underwood, is to pay to S. W. Bright, the party of the first part, the sum of $300 per month. If a mill of less than 100 tons per day crushing capacity is erected, the sum of $300 per month as well as fifteen per cent of the gross proceeds must be paid to S. W. Bright. Stoppage of work for a period of six months operates as a forfeiture of the agreement, the property thereupon to revert to the party of the first part with all improvements. Mr. Bright informs us that Mr. Underwood and his agent, Dr. Schupham, are expected here within a few days, and that he expects work will be commenced upon the mine within the next ten days. The deed has not been placed in escrow yet, but will be when Mr. Underwood arrives. Also a supplemental agreement will he made. It is claimed that a strong company has been formed in Chicago for the purpose of operating this and other claims that may he purchased. Stock has been disposed of sufficient to meet an expenditure of $6000 per month, and this amount it was anticipated would be doubled in a short time. This is the first property acquired by the company. There seems to he now a well-founded hope that this big mine will be started up in earnest shortly. Of course nothing can be said with any degree of certainty until the purchaser takes possession, but everything looks favorable that the sale will he consummated. In the development of the east or greenstone ledge of the mother lode, Jackson, and Amador county generally for that matter, has more reason to build her hopes of future prosperity than upon any other resource. The condition of the Zeila to-day sufficiently demonstrates this proposition. It is by far the largest employer of labor, and at the same time the most permanent mining property in the county. And it is the only mine operating on the east vein—a vein the croppings of which may be traced almost clean through the county.

At the Argonaut one thousand feet of new wire cable was received recently for the new hoisting works, which are to be completed and in running order by the 1st of July.

Mr. Wolfe, who has bonded the Fogus mine near Volcano, is putting up a ten-stamp mill on that property.

The Volcano Gold Gravel Company will commence cleaning up shortly. They expect the heaviest surrender of the precious metal ever made since the purchase of the mine by the present company. They have been operating in virgin ground all the season, and gravel, too, that gave all indications of being plentifully supplied with gold.

VOLCANO DISTRICT.—*Ledger:* Wolf and Campbell, who are opening up the Fogus mine, have placed an order with Knight & Co. for a ten-stamp mill, to be completed and erected by July 1st. They have opened up a twelve-foot ledge, which prospects well.

JACKSON DISTRICT.—Since assuming charge of the Amador Gold for the Jackson Gold Fields, James E. Dye has received letters which contain assurances that his company will commence work on the Amador Queen property as soon as possible. Mr. Dye is now putting two additional discharges to the one-stamp sample mill hy which he expects to double its crushing capacity, after which he will work several tons of ore from the Amador Queen as a test.

Butte.

GENERAL NOTES.—*Times:* The shaft on the Mascot mine, to he sunk 200 feet, has attained a depth of 150 feet.

The incline on the Standard mine at Oregon City is now down about 250 feet. They are running a Bryan mill to crush the ore.

Brown brothers and A. Autran will shortly open a placer claim near the Merrimac.

The new ninety-foot air shaft at the Spring Valley quartz mine, near Oregon City, has just heen completed, and three shifts of men will he put to work in the tunnel this week.

Alm and Mooney have started work on a river elaim near Enterprise. It will take about three weeks to get tbe mine in shape to work.

The Holt Flat Mining Co. are running a tunnel to tap the old river channel on their property near Enterprise.

THE SPRING VALLEY QUARTZ MINE.—At the old Spring Valley quartz mine, near Cherokee, owned by the Neshit estate and under hond to M. J. Reed, of this city, an old tunnel has heen cleaned out and is being pushed forward to crosscut the ledge. It is now in a distance of 500 feet, and an air shaft has been put down to tap it. If the ledge is what is expected the mill will he operated.

BONDED THE MINE.—The McKinley ledge, situated near Hurleton, has been bonded hy C. C. Belding and R. De Lancie. Extensive development work will he begun.

THE MASCOT AND STANDARD.—It is reported from Oregon City that the Mascot mine has struck an eight-foot ledge at a depth of about 300 feet, and that a four-foot ledge has heen struck in the Standard mine at a depth of 200 feet. Both properties have mills ready for operation.

Calaveras.

A MINE SOLD.—*Citizen:* The Nolander mine, situated near Middle Bar, has heen sold for $7000 to Jas. W. Provard. Tbe sale was completed Thursday. A large portion of the purchase price was paid at the time of the sale. The prospect is said to be an excellent one, and Mr. Provard is greatly pleased with his purchase. He left for the city Friday, intending to make arrangements for the necessary machinery, etc., to operate the mine to be shipped there. He intends to put a crew of men at work developing the mine as soon as possible.

FOURTH CROSSING.—*Herald:* The contract for sinking 100 feet in the shaft of the Thorpe mine at Fourth Crossing has been let to Messrs. Demartino & Solari of Angels. The mine is now down 200 feet and the prospects are very favorable.

DRIFT SLATE.—In piping the loosened gravel caused by the recent blast at the Central Hill gravel mine, near Murphys, a formation of drift slate was opened up which differs in its extent from any like deposit yet encountered in the mine. Underlying this is a deposit of dark red clay, which the miners call reddog. In working farther east on the Douglas Flat side of the Ceutral Hill, wherever the reddog was found it was sure to follow tbat a rich deposit of gold would be found lying on it and underneath it.

El Dorado.

THE BLUE GOUGE.—Special Corr.: At the Blue Gouge mine, twenty miles east of Placerville, development work is being pushed forward. Ore goes $8 per ton in free gold, 4% of sulphates assaying $315 per ton. A forty-stamp mill and chlorination works will be erected this summer.

THE GOLD NOTE MINE.—R. S. Raw has taken charge of the Gold Note mine, in Brownsville mining district, and has let a contract to sink the preseut shaft 100 feet deeper.

Messrs. Finch, Stevens and McKinuey have sold their placer mining claim, containing eighty acres, to parties connected with the Grand Victory mine.

Kern.

AMALIE DISTRICT.—(Special Correspondence.) Development work is being pushed as rapidly as possible on many of our claims. The Occidental which was originally located by A. Sauser and sold in November, 1894, to Messrs. Young, Foster & Co. has had some seven hundred feet of work done on it since the purchase.

There is now about three hundred and fifty tons of good milliug ore on the dump which was taken from three different leads and four different shafts, the deepest of which is down seventy-five feet, showing good milling ore all the way. From tbese shafts there have been drifts run to determine the widths of tbe ore shoots. While drifting from shaft number three on a three foot ledge of good milling ore a contact was struck, being the junction of the Amalie and Occidental lodes. At tbis junction a raise was put up to the surface aud sinking begun. The ore has gradually grown richer as they went down and at preseut there is a two foot vein of fine milling with some shipping ore.

At shaft number four, which was commenced about six weeks ago where tbe Amalie lode enters the Occidental property, they are also taking out some fiue shipping ore; the ore is a chloride silver carrying about one-third of its value in gold and is of the same character as that taken from the Amalie mine at a comparative deptb. On tbe first of last January the Occidental Co. started a tunnel which is now in four hundred feet, and when completed will cut three leads at the deptb of one hundred and seventy-five, two hundred and ten, three hundred and twenty feet respectively. The last of these, which will be cut at the depth of three hundred and twenty feet, is the Amalie lode from which so much rich ore has heen taken and which is uow developed to the depth of 200 feet on the Amalie property. The completion of the tunnel is looked forward to with great interest hy all who are familiar with the property. The best mining experts have predicted that it will open up some remarkahly valuable bodies of ore. This property joins the Amalie, aud its development so far shows chloride, ruby, sulphide and uative wire, about one-third the value of each being in gold; while from the Occidental there has been taken equally as rich chloride and horn silver as was ever taken from the Amalie at the depth to which the Occidental is at present developed. This property when thoroughly opened up will no doubt he equally as productive as anything in the camp.

The Amalie Co. has just put in a gasoline hoist which is doing fine work, using three pints of gasoline and raising five tons of ore per hour.

Mr. W. E. Rogers of the Amalie Mining Co. has gone to Sau Francisco to purchase some supplies for the company. He will return in ahout a week. G. E. F.

Mariposa.

REMARKS OF MR. COUCH.—Hon. Thomas Couch passed through Salt Lake City last Sunday on the way from Coulterville, Mariposa county, to Montana. When asked to tell what the company bad in California, he answered the *Tribune* that the property consisted of ahout twenty full claims on the mother lode, which there divides into two parallel veins; that their ground covered ahout two miles and a quarter on each vein, and included the town of Coulterville. He believes that the company has a mountain of ore which will work from $7 to $15 in the mill. About 60 per cent is free gold; the rest is in sulphurets. The company's property also includes the old Oak Flat ditch, which is taken from the Tuolumne river some thirty miles from Coulterville. The company is now putting up a mill, which will at once embrace forty stamps, with everything prepared to add sixty stamps more as soon as the entire power can he obtained. At one spot a few miles away so much fall can he obtained that 1000-horse (electric) power can be secured. At that point the company is arranging to erect their electric plant, and the power will be transmitted on wires to tbe works at Coulterville. The mines are inexhaustible; and as soon as full arrangements can be completed, the gold product of California will begin to be increased by from $3000 to $4000 daily. Tbat mother lode of California is becoming a wonder to the world. South Africa, by comparison, is not in it.

Nevada.

THE CHAPMAN MINE SOLD.—Messrs. Keating and Levy have bought the Chapman property for $35,000. It adjoins the Cbampion.

WILLOW VALLEY DISTRICT.

THE BELLEFONTAINE.—*Transcript:* The company developing the Bellefontaine mine are uow making an upraise for an air shaft. This upraise is to he 220 feet, and good ore is being taken out as work progresses.

The ledge was discovered by Harry Beech in 1858. He took nine tons of rock out of his first shaft, wbich, when crushed, paid in the neighborhood of $117.75 per ton in a mill at Grass Valley, and none of the sulphurets were saved. The lowest rock the mine ever produced paid over $24 per ton. On one portion of the ground tributers recently took out a crushing of ore wbich paid $44.53 per ton in free gold. Since then $30,000 bas been extracted from the claim by shafting on different parts of the ground. The principal owners of the property are W. H. Smitb and F. Snell of Nevada City.

Placer.

BONDED AND SOLD.—The Bartou aud Harlow mine, at Rocklin, is about to be sold. The purchase price is said to be $30,000.

W. A. Freeman and the Wallace estate have honded tbe Black Hawk mine, at Forest Hill, for a $40,000 sale.

Tbe McCall mine, situated at Gray Eagle Bar, on the middle fork of the American river, was sold for $40,000.

San Diego.

THE SHENANDOAH.—The Shenandoah mill at Mesa Grande is being repaired. The mine will be in working shape by August 1st.

Shasta.

SAYS IT WAS A "FAKE."—*Democrat:* The statement telegraphed from Redding some days ago by a "fly" reporter to the press to the effect tbat a miner's strike at Iron Mountain had been averted by the company raising wages was a fake. The wages were not raised and there was no strike contemplated. The wages are $1.50 per day for underground workmen and $1 per day for those on tbe surface.

Sierra.

GOLD RIDGE AND GOLD VALLEY.—The owners of the Gold Ridge mine, four miles below Milton, bave recently struck some very rich gravel. It is reported to go from 18 to 25 cents per pan.

Very rich rock has been struck in the Gold Valley mine within the last few days.

Siskiyou.

GENERAL NOTES.—*Journal:* A large open cut has been completed at the Benz Bar claim, at Honolulu, Klamath river, where the compauy at work is now taking out very rich pay. This is one of the richest claims on tbe river, and has paid in past seasons as high as $8000 in a single day from bottoming the bedrock.

The Greenhorn blue gravel mine of Austin & Co. still yields its regular weekly average of about a thousand dollars a week.

Good reports are received from Oro Fino of lively times in mining operations, tbe hydraulic mines being all in full operation with plenty of water. The Eastlick claim is expected to yield at least $30,000 for tbis season.

Newton Lamh's new quartz mill, near the Miner street crossing of Yreka creek, is almost ready to start up, only waiting for some new dies ordered from San Francisco. Several wagon-loads of quartz are in readiness for crushing, and teamsters will continue hauling from mines in this vicinity to keep the mill going. The benefit of a custom mill in Yreka will cause more prospecting and development of the numerous quartz ledges in the Humhug range on West side of Yreka, also at Hawkinsville and vicinity on the north, and at Greenhorn, Cherry Creek and Deadwood on the south.

A NEW MILL.—*Journal:* The Black Jack quartz mill, recently burned on Klamath river, near Hornbrook, is to be replaced with a mill of ten stamps capacity for crushing the blue gravel cement, which is very difficult to dissolve.

Hunter & Co.'s new ditch at Horse Creek, near Oak Bar, Klamath river, has heen completed for two miles, and will probably be finished to the four and one-tenth mile and end hy the 4th of July, to use in the rich Horse Creek diggings, showing excellent prospects wherever tested.

Lamh's new mill at Yreka creek is crushing quartz from the north fork of Greenhorn, supposed to contain from $50 to $75 per ton. The fine sand is saved and salted for running through the mill again, in securing the fine gold hard to separate from the sulphurets.

Tuolumne.

GENERAL NOTES.—*Democrat:* The Golden Gate mine is running steadily along day and night. The force of men employed is from 40 to 45 men.

The Black Oak mine at Soulshyville is coming out surprisingly well, and we now hear that the Scott Brothers have sold one-half of the property for $90,000.

The Birney, Wainwright, Hudson and Monroe people took out $1400 Wednesday.

At the lowest depth of the Rawhide, about 600 feet from the top, a large body of ore was recently developed.

The Marlow Mining and Development Company filed its articles of incorporation with the County Clerk Wednesday. The property to be operated is the Marlow Placer Claim northeast from and near Dan Berger's place —time of incorporation is 25 years; capital stock, $300,000—shares, same number—par value $1 each. Board of Directors—seven. Names and residences—John Graham, Forest Home, Amador Co., Frank J. Gross, Tuttletown; Cbarles E. Weinrich, Adolph E. Scheld, F. L. Enright, W. W. Anderson, George Stewart, Sacramento; Messrs. Graham, Gross and Stewart have 1,000 shares each; the remaining parties 500 sbares each. Capital stock, paid up is $5,000.

THE SEMINOLE CONSOLIDATED.—*Independent:* In the Seminole they are drifting at the 180-foot level, or No. 1, with excellent prospects. A newly erected steam hoist, with skips attached, for raising the ore, bas been completed. The main shaft will be sunk another 100 feet. The mill is at present crushing from the upper stopes, and running continually, day and night, on good pay rock. The plates look very well. On the Mayflower, a crosscut tunnel is being entered, wbich will tap the vein at 250 feet, vertical from surface. It has already advanced 45 feet. The country rock passed tbrough is metamorphic slate. The superintendent expects to intersect the vein in ahout 200 feet.

THE DEAD HORSE.—The ledge on tbe 1300-drift, 200 to 300 feet north from the main shaft is now carrying galena.

THE CONSUELLO.—This mine is to be resuscitated and a new 20-stamp mill built. It is estimated thousands of dollars value were washed away down the north fork of the Tuolumne, which now, if saved and treated by the present improved process, alone, will prove a good paying proposition, say nothing about the free gold in the rock tbat was only worked formerly.

THE JUMPER MINE.—Tbe mill is running day and night. Some timberiug is being done in the mine. Tbe shaft is unwatered. A level at the bottom is being opened to the south to intersect the rich shoots found in tbe upper levels. This is, so far, a dry mine. What water was in the shaft came from the surface percolations from last winter rains.

THE RAWHIDE.—At the 600-foot level, No. 2 sbaft, a crosscut east was entered that intersected a new vein of exceeding richness. Four skip loads came to grass, estimated at one-third gold.

NEVADA.

WASHOE CO.

THE WHITE HORSE MINE.—The owners of tbe White Horse mine, in White Horse district, are making arrangements to resume operations on the lead. They bave been sampling the ore and find that a selected piece assayed $364.10 in gold and ten ounces in silver to the ton, and an average sample assayed $31.39 in gold to tbe ton. There is a shaft over thirty feet deep on the lead and the samples assayed were from near the bottom of tho shaft, where the lead is over two feet wide.

NYE CO.

IN UNION DISTRICT.—The Belmont *Courier* says John Mayette has bougbt a ten-stamp mill of the Belmont Mining Company and moved it to Union district in western Nye to work ores from its mines. The ores of Union district carry considerable gold, and Mr. Mayette has 200 tons of rock on the dump ready for crushing.

OREGON.

JACKSON COUNTY.

C. O. White, superintendent of the Tolo Mining Company, reports a strike in the McDonough ledge, which is included in the Tolo placer purchase.

Another pocket of gold aud silver ore was taken from the Beekman & Huffer ledge on Jackson creek lately, which is much richer in gold than anything yet discovered in this ledge. No estimate of the value of these finds can be made on account of the rock being rich in both silver and gold.

Emil Holden, a scientific German, has discovered a silver and gold-bearing ledge on the divide between Jackson and Galls creeks, about four miles from Jacksonville, which is said to he the largest and most valuable discovery ever made in Southern Oregon. The ledge is 30 feet wide and has heen traced a distance of 6,000 feet. A large number of assays give the average value of the silver per ton at 50 ounces and $8 of gold. More prospecting is heing done in southern Oregon at the present time than ever before.

Ahout 60 miners are at work in Steamboat district, opening up placer mines, and the prospect is good for turning out considerable gold.

J. T. Layton's Farris gulch and Williamsburg hydraulic mines are heing operated with old-time vigor.

BAKER COUNTY.

Tbe Bonanza mine, on Chicken creek, is being developed. A 250-foot tunnel recently tapped a 2-foot vein of fine milling gold ore, which assays $150 to the ton.

Ellis & Cupid are operating their placers at Sumpter. They own hundreds of acres of paying ground and operate a hydraulic system with 15-inch pipe and 300-foot pressure.

MACHINERY FOR THE BONANZA.—*Democrat:* Supt. Al. Geiser, of the Bonanza mine, has 17,000 pounds of machinery at McEwen, which will he hauled hy wagon to the mine. It consists of a large engine and boiler, and hoisting works, which will he put in place at the mine at once.

WASHINGTON.

THE OKANOGAN COUNTRY.—Miller & Redpath are working on the Grand View at the hase of Mt. Chopacca on the west side of Palmer lake. They have sunk a shaft to the depth of 36 feet, and report the ledge 21 feet wide. The assays of the ore vary from $6 to $300 in gold. There are nine locations on this ledge.

Cowherd & Westren are getting the Ivanhoe mill ready for a summer run. They have ahout 150 tons of ore in the mill bins and ahout 700 tons on the dump at the mine. They are preparing a table covered with canvas to run the pulp over after leaving the

amalgamating tables to save the slime which has heretofore carried off considerable value. Their ores average about 40 ounces in silver and $6 in gold. Before the heavy decline in silver, this was considered the best silver proposition in the camp.

Cameron & Hart are continuously running their stamp mill on the Triune mine, Golden, with gratifying results.

A new Milwaukee company has a large force of miners at work on the Wyandotte and other claims that they have recently purchased of George Girty, on the Similkameen river, north of Palmer lake.

Henry Livingstone has recently put in a ditch and hydraulic on his placer claim on Eneas creek which he is now operating with good returns. Last season he worked the same claim by ground sluicing, and it paid well enough to warrant a more extensive plant. The gold is quite coarse, a piece weighing 50 cents not being uncommon, and it is worth about $17.50 per ounce.

There is more development work on mines in progress than at any time since 1892, and, as Congress did not enact a stay assessment lay this year, the number of men working will be constantly increasing till winter sets in, and considerable money will be sent here by interested outside parties for assessment work on their properties.

BRITISH COLUMBIA.

HORSEFLY AND VICINITY.—J. M. Browning, of Vancouver, agent for the Cariboo and Horsefly mines, says that in less than a month they will have their first cleanup. Already $60,000 have been expended this season, making the total spent on the two mines close to a half million dollars. The banks where the gold is said to be are very hard, and to facilitate washing them out 40,000 pounds of powder has been let off in T-shaped tunnels dug into them. The scheme was a success, the immense bank being heaved up several feet and the earth loosened from base to top. He expects that this season the $60,000 spent will be made up and a handsome dividend paid as well.

The Victoria Company has 45 men engaged on its claim on the Quesnelle river, opening up a ditch used some years ago.

Forty-five claims have been staked by private parties near the Horsefly, and are being worked by hand process. Some cleanups as high as an ounce a day are reported.

J. B. Hobson, manager of the Cariboo Hydraulic Co. at Quesnelle, says that more men are going into Cariboo than can find work. Quite a number are destitute, and it would be charity to dissuade those who have no means from going up.

GENERAL NOTES.—Kamloops *Sentinel:* The Cariboo Hydraulic Company is working two nine-inch nozzles, using 3000 inches of water with 200 feet head.

The Horsefly Hydraulic Company is working night and day with 2000 inches of water forced through seven-inch nozzles by a pressure of 150 feet.

A scheme is on at Quesnelle to dam the south fork and hold the water in Quesnelle lake, thereby laying the bed of the river bare, which is known to be very rich.

Last year the Quesnelle River Hydraulic Company built 450 feet of dam to raise the water in Dog lake, but the water has washed through beneath, so that probably no hydraulicking can be done this summer.

A fifth tunnel is to be run on the Slocan Star at a depth of 1200 feet. Twenty men are working, and 20,000 tons of concentrating ore await the concentrator, which will be put in at once. Two drills and an electric light plant will be put in this summer.

The Ottawa Hydraulic Mining and Milling Company, with a capital stock of $250,000 in $5 shares, has been incorporated to take over a lease of grounds on Boston Bar, Fraser river.

IDAHO.

TO EXPEND $15,000.—The Lemhi Gold Mining Company has received returns on a shipment of ore which yielded $61.80 in gold, silver and copper. Bids are now being received for the erection of a thirty-five-ton plant, to consist of Bryan mills and concentrators, which will be erected at once. This plant will cost about $15,000. The properties owned by the Lembi Company also produce free-milling gold ore and a very light grade smelting ore.

UTAH.

A DISAPPOINTMENT.—*Tribune:* The last work on the test of Midas ores by the pan-amalgamating method was completed yesterday when the amalgam from the vein in the Ontario mill was retorted. The result was another disappointment, as the amalgam showed only about 22½ per cent saved, and it is now a puzzle to find where the loss occurs. There were 18,220 pounds of selected ore put through the mill, the assay value of which was $6260 per ton; and as the run was made, the tailings were sampled at intervals and showed a loss of from 15 to 18 per cent, encouraging Messrs. Chambers and Mackintosh into the belief that, by the pan-amalgamating process, at least 82 per cent could be saved. Certainly, the loss cannot be found in the tailings, but where it exists is the puzzle.

The ore is very refractory and has withstood the Crawford mill, the cyanide process, the Roth amalgamator and now the pan amalgamator; but hopes are still entertained that a process will be found that will successfully treat the ores.

MONTANA.

The Odin mine, near Butte, has been sold to C. F. Booth, representing the Washoe Copper Company. The price to the original owners—P. A. Largey and E. O. Dugan—was $50,000. The leasers of the property got $50,000 also.

WYOMING.

AT CUMMINS CITY.—Cummins City, near the Colorado line, is receiving some attention. In 1880 Cummins was one of the liveliest camps in the West. Its downfall was attributed to the fact that the ores, although containing a large amount of gold, could not be profitably worked by the processes then in vogue. The miners were unable to separate the yellow metal as the ore was filled with iron which carried the gold from the plates. Three Chicago men have gone there with a furnace and other apparatus to determine the value of the mineral. They have located a number of claims, the titles to which have long since expired so far as the original mine owners are concerned.

NEW MEXICO.

THE COCHITI MINES.—The machinery for the Beckman ore reduction plant at Bland, consisting of ten stamps, engine and boiler and other needed appliances, has reached Wallace from California and will be transferred to the Cochiti district at once. The new mill building is ready for the reception of the machinery, and within the next few weeks everything will be in readiness for steaming up.

Roger W. Woodbury of Denver, president of the Cochiti Mining and Milling Company, says that, as soon as he can procure a competent man, and the proper method of treating the Cochiti ores, he will enlarge the mill at that place. The mining company, the milling company, the Allerton Townsite Company and the water company have all been consolidated under one management, of which Mr. Woodbury is president. W. C. Wynkoop of Denver has been tendered, and will probably accept, the office of manager of the combined interests.

COLORADO.

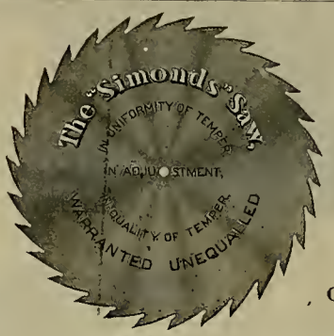
AROUND LEADVILLE.—It has been many years since the camp has been so full of life and mining activity and the prospect of a large amount of summer work has been so promising, says the Leadville *Herald-Democrat.* The gold belt has been very thoroughly discussed and exploited in print, and, in spite of the efforts of people who would prefer to see stagnation, continues to be the field of extensive and promising mining operations. There are, in the territory between Empire and Big Evans gulches, at least 35 companies at work, either engaged in putting down shafts or in shipping mineral. Among the new producers to be added to the gold belt mines are the Cleveland and Spot Cash. Both these properties have good bodies of mineral and are now in a position to hoist from eight to ten tons daily.

CRIPPLE CREEK MINES.—*Miner:* It is remarkable, but a fact, that not $5000 was spent on any one of the eighty-two pay mines of Cripple Creek before a strike of shipping ore was made, and in half the mines that are rich producers to-day the development work necessary to reveal the golden treasure cost less than $2000.

ARIZONA.

GOING TO BUILD A MILL.—Kingman *Miner.* The Gold Bug Mining Company have in contemplation the erection of a mill on the Colorado river, below the Gold Bug mines. The plant will have a capacity of over thirty tons per day. The district, in which is situated the Gold Bug, has long needed a mill and this one will be hailed with delight by the mine owners.

AT DOS CABEZAS.—*Prospector:* The bonding of the Casey mine, one of the best gold producers in the Dos Cabezas gold camp, for $90,000, and the investigating of other mines in this county by capitalists, is part of the attention gold properties of Cochise are receiving by monied men.



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Leather Belting, Dodge Wood Split Pulleys, Emery Wheels, Files.

GRAPHITE AND GRAPHITE GREASE, COVEL BELT HOOKS.

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MINERS' FAVORITE

Perkins Double-Acting PLUNGER PUMPS.

Capacity 2000 to 20,000 gals. per hour. Especially adapted for mines. Will raise water any height or distance and can be worked successfully under every possible situation. Pumps sand and water. No cylinder or pistons to wear out. For all particulars send to the

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CORNER FIRST AND MISSION STREETS, - - - - SAN FRANCISCO, CAL.

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MINING AND MILLING MACHINERY,

Automatic Cut-Off Engines, High-Speed Engines, Hoisting Engines, Quartz Mills, Manty Chili Mills, Rolls and Concentrating Machinery, Dodd Sigmoidal Water Wheel, PUMPS--Cornish and Other, Copper and Lead Furnaces, All Classes of Marine Work.

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CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

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Special attention given to the purchase of Mine and Mill Supplies.

Stamp Cam.

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MANHATTAN RUBBER BELTING, PACKING AND HOSE,
SANDERSON DRILL STEEL,
MORRIS CENTRIFUGAL PUMPS,
LIGHT STEEL RAIL.

A New Form of an Old Cure for Stiff Joints.

The application of heat is one of the universal remedies for the various forms of rheumatism. Almost every modern city has its Turkish or Russian bath, and innumerable uncivilized tribes enjoy the same luxury in cruder shape. Travelers in the Navajo country will often find close to the trail which leads to the neighborhood of water small huts such as children might build in imitation of Indian tepees. These are the "sweat huts" of the Navajos. When one of that intelligent and thrifty tribe finds himself beset by severe cold or rheumatic pains, he goes to a secluded spot close to water, and builds a little conical hut of sticks. The bottom ends of the sticks may be possibly two feet apart and the upper ends are lashed together in a point. The interstices of this rough edifice are carefully chinked up, and the inside is covered with a layer of mud, which makes it absolutely airtight. Then, building a fire, the Indian places stones on the embers. When the stones begin to crack with the heat they are cast inside the hut and water is thrown upon them. The Indian creeps in, closes the narrow entrance aperture and remains there in the steaming atmosphere until he is nearly suffocated. The latest form of this crude therapy is used in a London hospital. It consists of a copper cylinder about three feet long and eighteen inches diameter, which will hold an arm up to the shoulder or a leg up to the middle of the thigh. The patient, who is suffering from sprains or gout or rheumatic affections, is placed in an armchair, the limb is introduced into the cylinder and the joint made airtight by a rubber band. The inside temperature of the cylinder is raised if necessary, to 300 or 400 degrees Fahr., by means of gas burners. When the enclosed moisture begins to have a scalding effect, which occurs at about 250 degrees, the end of cylinder is opened and the moisture escapes. The effects are greatly increased local circulation, profuse perspiration and relief from pain.

Water Power and Electric Transmission.

A power station with electric transmission has recently been made in Fitchburg, Mass., which has some features of special interest and is attracting much attention. The water supply is obtained from the Wanoosnoc river, which has a minimum flow of 2000 cubic feet per minute. This is brought to the power house in a 36-inch pipe line 1800 feet long, terminating in a receiver 48 inches in diameter, to which the wheels are connected by lateral branches.

The power station is located about three miles from the city of Fitchburg, and consists of six Pelton wheels, 28 inches diameter, having an aggregate capacity of 600-H. P., all running on one shaft enclosed in three separate compartments, as shown in cut. The wheels run under a head of 130 feet at 135 revolutions per minute and are direct connected to a 300-K. W. Westinghouse two-phase generator. The current is generated at a potential of 2250 volts and handled at this pressure on a switchboard which is transferred directly to the transmission circuit. The exciter is run by a separate Pelton wheel at 1150 revolutions, carrying 110 volts. The power thus generated is transmitted to the Simonds saw factory two and one-quarter miles distant, where the potential is reduced to 220 volts by means of two 100-K. W. Westinghouse transformers, the current operating eleven motors of various capacities, these being of the Tesla self-starting type.

The speed of the wheels is controlled by a Pelton differential governor and the regulation afforded is entirely satisfactory under what is regarded as the most difficult conditions anywhere to be found, owing to the constant and wide variations of load.

The entire power is used by the Simonds Saw Works, one of the largest factories of the kind in the country, and the working power station has been so satisfactory that a material enlargement has already been decided upon. Pelton wheels, in such favor and so exclusively used throughout the West, are now coming largely into use in the East, as well as in most all foreign countries.

The New York works of the Pelton Company enable them to fill orders from Eastern States, as well as many foreign countries, where freight rates would be prohibitive from this side.

CHEAP **ACIDS!** CHEAP

Sulphuric, Muriatic, Nitric.

STAUFFER CHEMICAL CO.,

LARGEST WORKS IN THE WEST.

Manufacturers also of

SULPHUR,

Powdered, Sublimed Roll and Wicks.

Sal Soda, Soda Ash, Whiting, Paris White, Carbon Bisulphide and Soldering Fluid.

Address:

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Dividends Wanted.

Many paying properties might pay more, and others just paying expenses might pay dividends, if properly managed.

If in need of a thorough, practical manager, of large experience and well recommended, address

BOX L, MINING AND SCIENTIFIC PRESS.

TUBBS CORDAGE CO.

(A CORPORATION.)

Constantly on hand a full assortment of Manila Rope, Sisal Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc. ☞Extra sizes and lengths made to order on short notice

611 and 613 FRONT ST., San Francisco, Cal.

THE WILSON

HIGH GRADE STEEL

SHOES

—AND—

DIES.

Guaranteed to Wear Longer and Prove Cheaper than any others.

Made by use of Special Appliances.

PATENTED AUGUST 16TH, 1892.

—Made only by—

Western Forge and Rolling Mills,

ST. LOUIS, MO.

WM. A. HEWITT, - - Agent,

11 and 13 First St., San Francisco.

QUICKSILVER!

—FOR SALE BY—

The Eureka Company,

OF SAN FRANCISCO.

ROOM 1. - 426 CALIFORNIA STREET,

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The I. B. HAMMOND CO.

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MANUFACTURERS OF

Stamp Mills, Ore Feeders

DETACHABLE BUCKET WIRE-ROPE TRAMWAYS,

Roller Grinding Pans, Desulphurizing Furnaces, Etc.

Improved Self-Contained Cushion-Frame Five-Stamp Mill.

The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The Term "Self-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

FIRST: There is Saved by the Use of This Mill a Large Bill for Heavy Timbers, in Many Instances Obtained at Great Expense and Loss Of Time.

SECOND: The Saving in Mill-Wright and Mechanics' Labor in Framing and Erecting.

THIRD: The Large Amount of Space Saved.

Send for Catalogue and Price List.

CORRESPONDENCE SOLICITED.

L. C. MARSHUTZ. T. G. CANTRELL.

NATIONAL

IRON WORKS,

N. W. Cor. Main & Howard Sts., San Francisco.

MANUFACTURERS OF

STATIONARY AND COMPOUND

ENGINES,

FLOUR, SUGAR, SAW AND QUARTZ MILL

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AMALGAMATING MACHINES.

CASTINGS AND FORGINGS

OF EVERY DESCRIPTION.

All work tested and guaranteed.

IMPROVED PORTABLE HOISTING ENGINES.

Sole Manufacturers of

Kendall's Patent Quartz Mills.

Having renewed our contract on more advantageous terms with Mr. S. Kendall for the manufacture of his Patent Quartz Mill, we are enabled to offer these mills at Greatly Reduced Prices. Having made and sold these mills for the past 14 years, we know their merits, and know that they have given perfect satisfaction to purchasers, as numbers of commendatory testimonials prove. We feel confident, therefore, that at the prices we are now prepared to offer them, there is placed within the reach or all a light, cheap and durable mill that will do all that is claimed for it and give entire satisfaction.

MARSHUTZ & CANTRELL.

Send for Circulars and Price List.

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L. PETERSON, MODEL MAKER,

226 MARKET ST., N. E. Corner Front (Up Stairs), SAN FRANCISCO. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential*.

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All kinds of tools. Fortune for the driller by using our Adamantine process; can take a core. Perfected Economical Artesian Pumping Rigs to work by Steam, Air, etc. Let us help you. THE AMERICAN WELL WORKS, Aurora, Ill.; Chicago, Ill.; Dallas, Tex.

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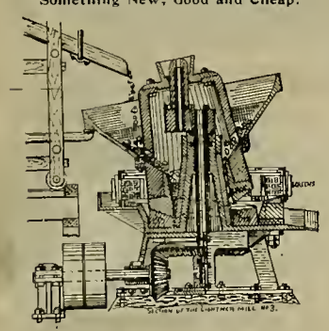
HIGHEST PRICES PAID FOR GOLD, SILVER AND LEAD ORES AND SULPHURETS.

Manufacturers of
BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, ETC., ETC.

Also Manufacturers of
STANDARD SHOT-GUN CARTRIDGES,
Under Chamberlin Patent.

THE LIGHTNER QUARTZ MILL.
Something New, Good and Cheap.



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WM. H. BIRCH & CO.
Also Manufacturers of
Cary Steam Pumps, All kinds of Mining Machinery, Boilers, Engines, Ore Buckets, Ore Cars, Cages, Hoists, etc.
119 Beale St., San Francisco.

Power, Mining, Milling, Smelting, Concentration and Leaching Machinery; Return Tubular and Water Tube Boilers, Corliss Engines, Jones' Mechanical Stokers, Hoisting Engines, Riedler Air and Gas Compressors, Riedler Pumping and Blowing Engines, Cornish Pumps, Roots Blowers, Copper Converters, Pyritic Smelters, Horseshoe Roasting Furnaces, Comet Crushers, Crushing Rolls, Stamp Mills, Shoes, Dies, Perforated Metals, Sectional Machinery, Huntington Mills, Frue Vanners, Bridgman Samplers, Concrete Mixers, Heavy Machinery and Mine Supplies. = = Write for Catalogues

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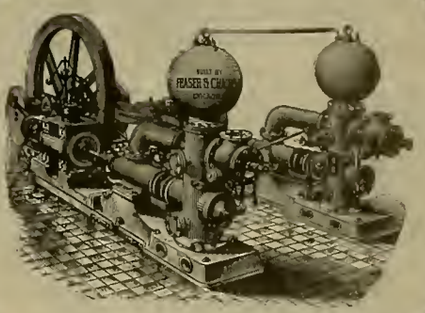
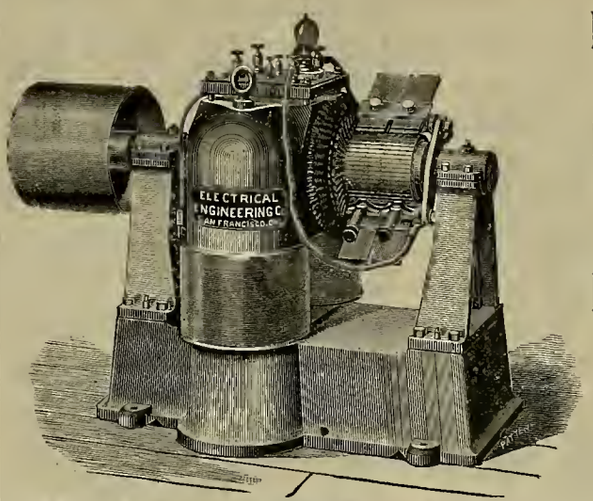
CHICAGO, ILL., U. S. A. and
43 Threadneedle St., E. C., London, Eng.



Works at Chicago, Ill., U. S. A., and Erith, Kent, Eng.
Branch Offices: 2 Wall St., New York; City of Mexico, Mex.; 527 17th St., Denver, Colo.; Helena, Montana; Salt Lake City, Utah.

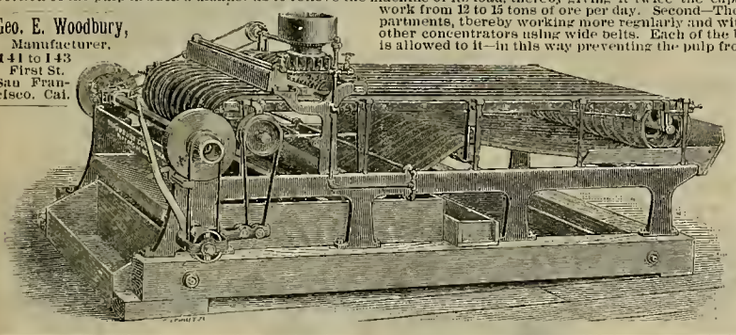


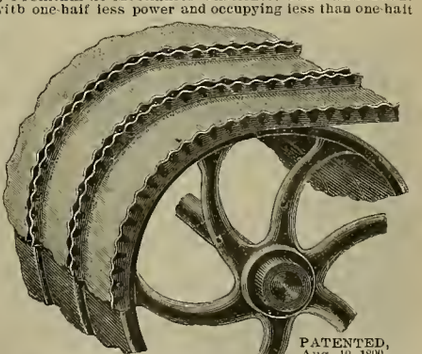
Electrical Engineering Co.,
MANUFACTURERS OF
Dynamos and Electric Motors
FOR THE TRANSMISSION AND DISTRIBUTION OF POWER
Electric Power Apparatus
FOR
Quartz Mills, Hoisting, Pumping, Drilling,
And all Mining Work where Long Distance Transmission is required
✦✦✦ A SPECIALTY. ✦✦✦
OFFICE AND WORKS: 34 and 36 Main Street, San Francisco, Cal.

THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891. MORE THAN DOUBLE THIS CAPACITY with one-half less power and occupying less than one-half the space of any other concentrator. Built of best Steel and Wrought Iron. Strong and durable. Price $575 f. o. b. Send for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

Geo. E. Woodbury,
Manufacturer,
141 to 143
First St.
San Francisco, Cal.





PATENTED, Aug. 19, 1890.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1895.

The McGlew Ore Concentrator Company.

PATENTED SEPTEMBER 19, 1893. CHEAPEST, SIMPLEST, MOST DURABLE AND CLOSEST SAVING CONCENTRATOR IN USE. FRANK BARRERE, Secretary and Manager

Can be seen in operation at the Company's works, 132 Main Street, San Francisco.

Office, 116 Davis Street.

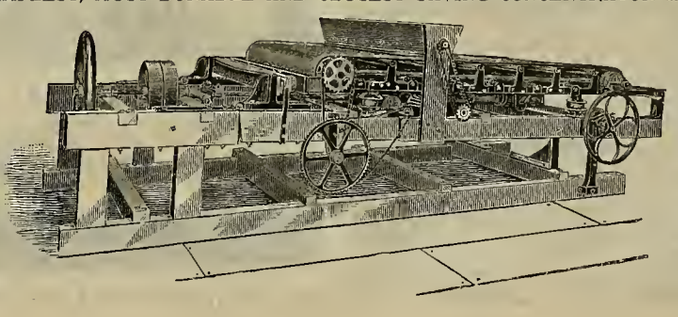
NINETY-FOUR AND ONE-HALF PER CENT
—SAVED—
ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness combining both Side and End Motion with a Bumping Belt.

SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.
THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works

Market Reports.

The Markets.

SAN FRANCISCO, June 6, 1895.

Silver has certainly become a national question and supersedes the tariff as a topic of party discussion. The day has passed when the argument can be used that silver is a "commodity" the market price of which is of more interest to the silver miner than any one else. The one State of Illinois has lost more by the slump of silver during the last lustrum than all the miners in the Pacific States and Territories. They are just finding it out.

There is a firmer tone throughout the entire metal market.

New York Metal Market.

NEW YORK, June 6.—PIG IRON—Scotch, 19@20c; American, 9.50@10.50c.

COPPER — Brokers', 10.50c: exchange, 10.60c.

LEAD—Brokers', $3.07½; exchange, $3.27½.

TIN—Straits, 14.20@14.25c.

SPELTER—Domestic, $3.60.

New York Silver Prices.

NEW YORK, June 6.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30⅝	66⅞	10 50	.....
Saturday	30⅞	67	10 50	3 10
Monday	30¾	66⅞	.....	3 07½
Tuesday	30⅝	66⅞	.....	.....
Wednesday	30½	66⅞	10 50	3 10
Thursday	30½	67	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	5
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.87½
London Merchants	$4.86
London Sight Bankers	$4.89
Refined Silver, per ounce	67c
Mexican Dollars, nominal	53c

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt, ¼ & 5-16, 17c; ⅜ and larger			16c
Lake Superior Sheathing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
TIN PLATE.			
Per bx	5 25	@	6 00
PIG TIN.			
Per lb	15	@	16 00
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	39 00	@	— —

Mining Share Market.

SAN FRANCISCO, June 6, 1895.

The little see-saw on the street left prices and values in about the same condition. The decline in Bodie, and the non-appearance of the Hale & Norcross decision, were secondary to the interest manifested in the latest and best movement—the consolidation of Comstock interests in thoroughly prospecting the Brunswick lode. F. Leonard, the newly elected president of the Comstock Tunnel Co., and two of the directors will be in Virginia City next week, and, it is expected, will visit this city to confer with the directors of the various companies concerned in the new movement. The most sanguine claim that the proposed working of the Brunswick ground will create a revival of old bonanza days in that vicinity.

A statement of the cash balances of the following mining companies on the first Monday of June is appended:

BODIE MINES.		Exchequer	$ 2,037
Bodie	$12,618	Gould & Curry	6,502
Bulwer	2,197	Hale & Norcross	5,245
Mono	2,501	Julia	.....
Standard	35,884	Justice	224
WASHOE MINES.		Kentuck	2,304
Alpha	$ 2,483	Lady Wash'n	1,560
Alta	317	Mexican	2,123
Andes	11,214	Opbir	12,581
Belcher	8,887	Overman	10,767
Best & Belcher	3,446	Occidental	1,290
Bullion	4,850	Potosi	11,171
Caledonia	2,836	Savage	11,017
Challenge	828	Scorpion	480
Chollar	7,430	Seg Belcher	4,324
Con. Cal & Va	52,800	Silver Hill	2,078
Confidence	5,558	Sierra Nevada	11,189
Con. Imperial	427	Union Con	6,112
Con. New York	1,478	Utah	742
Crown Point	15,704	Church	5,622
East Sierra Nev	88	Gray Eagle	1,164

The Con. Cal. & Va. has $18,395 in unsold hullion on band.

The followiog mining companies reported having an indebtedness on the first Monday of June:

Belle Isle	$ 3,012	North Com'wealth	$ 4,440
North Belle Isle	868	Silver King	3,108
Navajo	1,110	Summit	635

The Standard Consolidated Mining Company of Bodie has declared a dividend of 10c per share, payable on the 20th.

During May at the Alaska-Treadwell mine the mill ran 29½ days and crushed 22,226 tons, averaging $8 20 per ton: there were 342 tons sulphurets treated, yielding $25,240: the total bullion output was $71,319. The expenses for the month were $23,413.

The following illustrates the changes of the week:

MINES.	29	6
Alpha	.....	.....
Alta Consolidated	$ 07	.....
Andes	10	.....
Belcher	43	$ 32
Best & Belcher	47	41
Bodie	62	40
Bullion	11	.....
Challenge	21	19
Chollar	.....	18
Confidence	.....	.....
Consolidated California and Virginia	2 35	2 35
Consolidated New York	.....	.....
Crown Point	43	35
Exchequer	.....	.....
Gould & Curry	.....	23
Hale & Norcross	87	88
Justice	.....	03
Mexican	30	30
Ophir	1 35	1 30
Overman	18	.....
Potosi	37	35
Savage	36	33
Sierra Nevada	50	49
Union	30	.....
Utah	.....	.....
Yellow Jacket	44	40

San Francisco Stock Board Sales.

SAN FRANCISCO, June 6, 1895.

9:30 A. M. SESSION.

150 Belcher	32	500 Justice	03
450 Best & Belcher	41	200 Kentuck	02
500 Bodie	40	300 Mexican	30
200 Chollar	18	50 Occidental	18
250 Con Cal & Va	2 35	100 Ophir	1 25
300	2 30	100	1 30
500 Crown Point	35	100 Potosi	35
200 Gould & Curry	23	200 Savage	33
100 Hale & Norcross	88	300 Sierra Nevada	47
100	87	300 Yellow Jacket	40

SECOND SESSION—2:30 P. M.

200 Bodie	39	100 Caledonia	05
200 Belcher	32	100 Challenge	19
600 Best & Belcher	40	500 Justice	03
100 Con Cal & Va	2 30	300 Ophir	1 30
100 Chollar	17	100 Sierra Nevada	49

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING MAY 28, 1895.

539,971.—CAN OPENER—W. N. Anderson, S. F.

539,787.—GATE—J. F. Bean, Martiuez, Cal.

540,149.—SASH FASTENER—D. A. Crichton, Los Angeles, Cal.

540,150.—SASH FASTENER—D. A. Crichton, Los Angeles, Cal.

539,804.—GOLN SEPARATOR — Gibbens & Murray, Portland, Or.

539,806.—PHONOGRAPH—L. Glass, S. F.

540,099.—CAN OPENER—T. B. Hagerty, S. F.

540,057 —CAR COUPLING—T. F. Hudson, Pasadena, Cal.

540,060.—ELECTRIC RAILWAY—W. E. M. Jackson, S. F.

540,061.—BAND CUTTER—W. S. Judd, San Diego, Cal.

539,991.—LEAF TURNER—H. Kramer, S. F.

540,212.—SMOKE CONSUMER—T. P. Magrath, S. F.

539,997.—HAY DERRICK—D. Ogilvie, Lee, Nev.

540,195.—COIN CONTROLLED APPARATUS—G. F. W. Schultze, Berkeley, Cal.

540,202.—PIPE—H. F. Williams, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CAN LABELING MACHINE.—Emmett E. Magee, San Jose, Cal. No. 539,280. Dated May 14, 1895. This invention relates to a machine for placing labels upon cans. It consists of mechanism by which the labels are cut singly from a continuous sheet and delivered upon a table, an inclined track situated beneath the cutter and the table over which track the cans roll by gravitation, stops actuated in unison with the cutter so that a single can is allowed to pass when each label is severed from the sheet, a paste receptacle and roller in the pathway of the can by which a strip of paste is applied to one side of the can, so as to engage the projecting end of the label, an endless traveling belt between which and the can the label is received so as to press it upon the can and draw it off the table while the can continues its rotation; a second paste receptacle and roller by which another strip of paste is applied so as to receive the opposite end of the label which is pressed down upon the can by an endless traveling belt previously mentioned.

GAS ENGINE.—H. J. Dykes, Peralta, Cal., assignor of one-half to Julius A. Frost, of Oakland, Cal. No. 539,122. Dated May 14, 1895. This invention relates to improvements in gas or explosive engines. It cousists of a cylinder with a piston and crank shaft, au explosion chamber exterior to the cylinder having a tubular connection through the cylinder head, and an exhaust valve for the cylinder, an electric contact device within the explosion chamber connected with a hattery wire and a longitudinally moving ignition plate, or arm, extending through the tubular connection, so that one end enters the explosion chamber in line with the fixed electric contact point, and the other end projects into the cylinder, so that when the piston arrives at that end, and the gas is properly compressed, it forces the movable contact rod into the explosion chamber, making a contact with the other electrode and producing the electric spark for the explosion. The movable electrode is connected with contact devices on the exterior of the cylinder, and suitable mechanism is provided for actuating the movable contact and opening and closing the exhaust valve.

BALING PRESS.—Jose Jacintho Mathias, Mountain View, Cal. No. 539,588. May 21, 1895. This haling press has two vertically disposed haling chambers, each having a follower within it, said followers operating alternately so that the haling and discharge operations are continuous. The followers are operated alternately by means of crossed levers connected with their bottoms and which travel over underlying continuous tracks common to both pairs of levers and an oscillating power drum from which a single chain extends, and is properly guided to both followers whereby it operates them. There is a slide door affording access to the feeding chamber of the press, a spring connected with the lower portion of the door which tends to hold the door normally open, and an automatic tripping device operated by the follower, whereby the door is released from a locked vertical position and allowed to open under the influence of its spring.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from John B. Rathburn et al in the Lost Camp mine, near Blue Canyon, Placer county, to impound tailings behind brush dam in Wood's Ravine; and from A. J. Mason, in the McFadden mine, near Mokelumne Hill, Calaveras Co., to impound tailings behind rock and brush dam in Buckeye gulch, gives notice that a meeting will be held at Room 22, Flood building, San Francisco, Cal., June 17th, 1895, at 1:30 P. M.

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ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Alpha Con, Nev	14	5c	May 23,	Jun 27, July 18	C E Elliott, 309 Montgomery
Alta M Co, Nev	49	10c	May 6,	Jun 11, July 2	J E Jacobus, 309 Montgomery
Andes S M Co, Nev	41	15c	May 1,	Jun 1, Jun 17	J W Twiggs, 309 Montgomery
Chollar M Co, Nev	40	25c	May 14,	Jun 15, July 11	C E Elliott, 309 Montgomery
Gold Bar Cons M Co., Cal	1	2c	May 24,	Jun 29, July 22	E C Godfrey, Crocker Building
Hale and Norcross M Co	107	20c	May 29,	July 3, July 25	A B Thompson, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19,	May 31, July 26	J Henry Smith, 431 California
Justice M Co, Nev	59	10c	May 7,	Jun 11, Jun 28	R E Kelly, 309 Montgomery
Mexican G & S M Co. Nev	52	25c	May 13,	Jun 17, July 10	C E Elliott, 309 Montgomery
Overman, Nev	73	10c	Apr 15,	May 21, Jun 11	Geo D Edwards, 414 California
Savage M Co, Nevada	86	20c	Apr 19,	May 22, Jun 11	E B Holmes, 309 Montgomery
Sonora Extended M Co, Cal	2	2½c	June 1,	July 6, July 27	C A Stratton, 213 Jackson
Yellow Jacket, Nev	59	25c	Apr 15,	May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Bodie Con M Co, Cal	M E Willis, 309 Montgomery	June 17
Chollar, Nev	C E Elliott, 309 Montgomery	June 12
Gould & Curry M Co, Nevada (Special)	A K Durbrow, 309 Montgomery	June 12
Potosi, Nev	C E Elliott, 309 Montgomery	June 12

Assessment Notices.

ALTA SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of May, 1895, an assessment (No. 49) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 11th day of June, 1895, will be delinquent, and advertised for sale at puolic auction, and unless payment is made before, will be sold on TUESDAY, the 2d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. E. JACOBUS, Secretary.

Office, Room No. 33, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

GOLD BAR CONSOLIDATED MINING COMPANY—Location of principal place of business, San Francisco, California Location of works, La Porte, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 24th day of May, 1895, an assessment, No. 1, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of June, 1895, will be delinquent and advertised for sale at public auctiou; and unless payment is made before, will be sold on MONDAY, the 22d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

Office—38 Crocker Building, San Francisco, California.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of June, 1895, an assessment, No. 2, of 2½ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the corporation, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of July, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 27th day of July, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

STOCKHOLDERS' MEETING.

SPECIAL MEETING OF THE STOCKHOLDERS of the Gould and Curry Silver Mining Company.—Notice is hereby given that, pursuant to resolution of the Board of Directors, a special meeting of the stockholders of the Gould and Curry Silver Mining Company will be held at the office of the Company, Room 69 in the Nevada Block, No. 309 Montgomery Street, San Francisco, WEDNESDAY, the 12th day of June, 1895, at 12 o'clock M. The object of said meeting is to decide, vote upon and ratify a proposition to purchase additional mining ground.

Dated San Francisco, May 24th, 1895.

A. K. DURBROW, Secretary.

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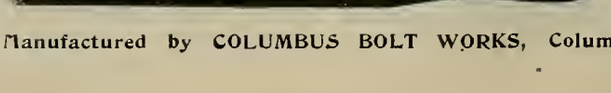

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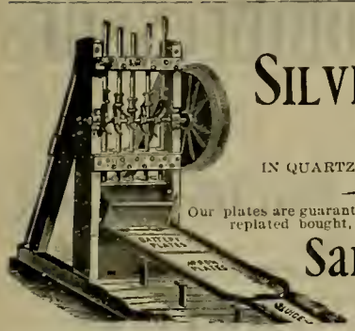

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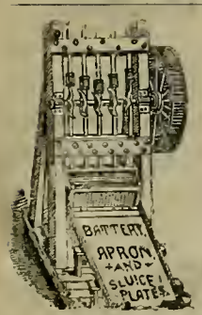

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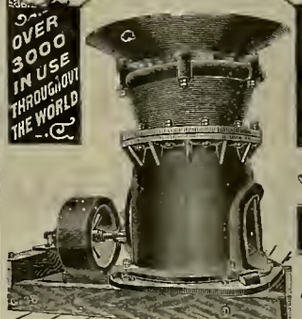

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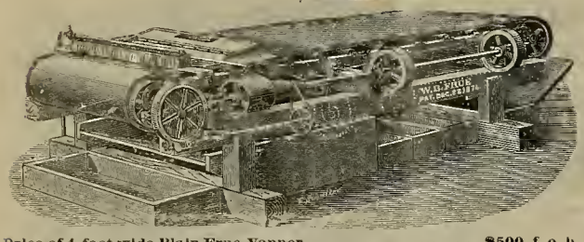

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GLADSTONE MINING COMPANY, C. J. Clark, M. E., Gen'l, Supt. FRENCH GULCH, Shasta Co., Cal., Dec. 12, 1891.

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C. J. CLARK, Gen'l Supt.

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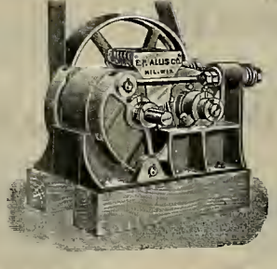

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VOLUME LXX. Number 24.

SAN FRANCISCO, SATURDAY, JUNE 15, 1895.

THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

California Marble.

Previous issues of this paper bave given prominence to many of California's structural materials, showing a wealth of mineral deposit second only to the metallic treasure within our borders.

This week is presented two views of California marble quarries, one in Inyo, tbe otber in Tulare county. As in the case of other valuable building material, marble is found in nearly every part of the State. Valuable deposits of this beautiful form of limestone have been found in Amador, Butte, Calaveras, El Dorado, Humboldt, Inyo, Kern, Madera, Nevada, Riverside, San Bernardino, San Diego, Santa Clara, Shasta, Tuolumne aud Tulare counties. In Amador tbere are three fine quarries, one a blue-veined marble near Jackson, another of red marble near Ione, and a white marble in the vicinity of Plymouth. On the Feather river in Butte county is a fine deposit, unworked. In Calaveras county, as in other sections of the State, lack of transportation facilities prevents the quarry below Vallecito from heing worked. El Dorado county is ricb in marble. Near Placerville Bind & Co. operate marble works. Humboldt possesses marble, but too remote to be of preseut commercial value. White, black and variegated marble is quarried near Keeler, Inyo Co. Some of the Inyo marble is in use in this city, and attracts deserved attention. The Madera marbles, near Hite's Cave, are undeveloped. Iu Nevada Co. tbe South Yuba Marble Co., near North Bloomfield, furuishes merchantable marble. Near Colton is some of tbe handsomest marble in the State, and there is an undeveloped deposit of snow-white marble near Whitewater. Victor, San Bernardino Co., shows a fine-grained quality, and at San Jacinto, San Diego Co., is a deposit of pure wbite marble, but almost inaccessible. Ahout five miles from the New Almaden quicksilver mine, Santa Clara Co., lies fine-handed marble in a most favorable location for shipment. The Red Bluff Marble Co., of Shasta, supply a large local trade. Near Sonora and at Columbia, Tuolumne Co., an excellent quality of marble is being quarried. The Rocky Point, Tulare Co., marble quarry also furnishes abundance of this beautiful crystallized limestone, which, from the earliest days of Greece to these sunset days of the 19tb century, has been so highly valued for statuary and ornamental building. The value of the marble industry of California for '94 is estimated at $200,000.

INYO MARBLE QUARRIES (WHITE).

ROCKY POINT MARBLE QUARRY, TULARE COUNTY.

In the Interests of the Miners.

The legislative committee of tbe State Miners' Association has drafted a bill which will be presented at the next session of Congress. The changes from tbe present law are easily recognizable. While tbe interests of the Government are carefully guarded and the public requirements fully observed, the proposed revision makes it wholly possible (as against almost wholly impossible as at preseut) for a miner to show that a tract in question is mineral land. It transfers the trial aud determination of tbe question from an ignorant to a competent tribunal, and places the contest in tbe court in the county in which the land in dispute is situated. The full text of the proposed revision is as follows:

A Bill to amend Chapter Six, of Title Thirty-two, of the Revised Statutes, relating to Mineral Lands and Mining Resources.

Be it enacted by the Senate and House of Representatives of the United States, in Congress assembled: SECTION 1. That section twenty-three hundred and twenty-four of the Revised Statutes he amended so that the same shall read as follows:

"SEC. 2324. Miners of each mining district may make regulations not in conflict with the laws of the United States, or with the laws of the State or Territory in which it is situated, governing the location, manner of recording, amount of work necessary to hold possession of a mining claim, subject to the following requirements: The location must be distinctly marked on the ground so that its boundaries can be readily traced, such marking to include one post or monument at each corner of the claim. All records of mining claims hereafter made shall contain the name or names of the locators, the date of the location and such description of the claim or claims located by reference to some natural object or permanent monument as will identify the claim. On each claim located, and until payment of the purchase money and a certificate

(Continued on next page.)

MINING AND SCIENTIFIC PRESS.

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J. F. HALLORAN.....General Manager

San Francisco, June 15, 1895.

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THE receut statement iu this column that S. W. Lamoreux, the commissioner of the general land office, appears to he a willing tool of the S. P. Co., in the present contest hetween that corporation and the Cal. Miuers' Association, receives fresh confirmation this week in that official's reversal of his own rules in deciding plainly against all equity and in favor of the corporation. His official acts appear to he hased on the proposition that, if the S. P. Co. wants agricultural land to be declared mineral land, it shall he so ordered. If the facts are in direct opposition to such declaration, so much the worse for the facts. This U. S. official has dismissed a protest made hy E. H. Benjamin, on hehalf of the California Miners' Association in defiance of the law, in disregard of his own rulings and directions, and in opposition to the plainest provisions of his own instructions of July 9, '94. In short, he has done this just hecause he could, hecause his official position gives him the opportunity. We are more sorry than surprised to chronicle this action on the part of so prominent a federal official. Such persistent prostitution of so high a post gives great color to the helief so generally asserted that undue influence is brought to hear upon Commissioner Lamoreux, aud that his acts are plainly dictated by those who appear to consider they have the same right of control that huyers usually have of any purchased commodity. We do uot charge Commissioner Lamoreux with heing hought. But he acts with singular similarity to men in and out of federal position who have heen influenced that way. Meanwhile, California miners can understand how extensive are the operations of the power they are at present opposing and the need of supplying the Association that is fighting their hattles with money to keep that fight up. An appeal will he filed by the committee ou the protection to mineral lands and the validity of Mr. Lamoreux's action contested. When Messrs. Ricketts and Ralston were recently in Washington they quickly realized that it was useless to waste time with the commissioner of the general land office. He and his suhordinates appeared to he impervious to argument or statemeut of any other side than that of the corporation. The President of the United States was interviewed, he promising to give the matter his personal attention. It is prohahle that neither he nor the Secretary of the Interior know auything of this recent prank of Mr. Lamoreux's. That gentleman places himself in a very suspicious position. No pettifogging shyster in a country justice court ever attempted a more contemptihle evasiou of honorahle practice than the commissioner of the general land office in the case under discussion, wherein, under the flimsiest form of subterfuge, he tries to throw out a protest made hy the Cal. Miners' Association against the absorptiou in the Los Angeles district of an area of mineral land hy the S. P. Co., construing every possihle meaning of words against the association and in favor of the corporation. The present appears to he a very good time for Mr. Cleveland to make good his pledge to Mr. Ricketts that these matters would receive his personal attention.

In the Interests of the Miners.

(Continued from preceding page.)

of eutry has heen issued therefor, not less than $100 worth of labor shall he performed or improvements made during each year.

"Where such claims are held in common such expenditure may he made upon auy one claim by any work or improvements tending to develop any of such claims. The period within which the work required to he done annually on mineral claims is to he performed shall commence at 12 o'clock meridian on the first day of January succeeding the day of location of such claim. When the lahor required by this act shall have heen performed or the improvements made an affidavit may he filed within thirty days after the time limited for the performance of such lahor or making of such improvements with the Recorder of Deeds in the county in which the claim or mine is situated, particularly describing the lahor performed and the improvements made, and the value thereof, which affidavit shall be prima facie evidence of the facts therein stated; aud upon a failure to comply with the conditions of this act, in the performance of lahor or the making of improvements, the claim or mine upon which such failure occurred shall he open to relocation in the same manner as if no location had ever heeu made; provided that the origiual locators, their heirs, assigns or legal representatives do not resume work upon the claim after such failure and hefore such relocation, and continue the same with reasonahle diligence until the required amount of labor shall have been performed or improvements made. Upon the failure of any one of several co-owners to contrihute his proportion of the expenditure required herehy, the co-owners who have performed the labor or made the improvements may, at the expiration of the year, give such delinquent co-owner personal notice in writing, or notice hy puhlication in the newspaper published nearest the claim for at least once a week for ninety days, and if at the expiration of ninety days after such notice in writing, or hy publication, such delinquent shall fail or refuse to contrihute his proportion of the expenditure required hy this section, his interest in the claim shall become the property of his co-owners who have made the required expenditure. The copy of such uotice, together with an affidavit showiug personal service or publication, as the case may he, of such notice, when filed and recorded with the Recorder of Deeds in the county in which such mining claim is situated, shall he prima facie evidence of the acquisition of title of such co-owners. Where a person or company has run or may run a tunnel, or coustructed roads or trails, for the purpose of developing a claim or claims owned hy said person or company, the money so expended in running said tunnel or constructing said roads or trails shall he taken and considered as expended on said claim or claims; provided, further, that said claim or claims shall he distinctly marked ou the surface, as provided in this act."

SEC. 2. That section twenty-three hundred and twenty-four of the Revised Statutes he amended by adding thereto the following:

"And the surveyors appointed under the provisions of this section shall have power to administer oaths to their assistants."

SEC. 3. That section twenty-three hundred and thirty-five of the Revised Statutes be amended so as to read as follows:

"SEC. 2335. All affidavits required to he made under this chapter may he verified hefore any officer authorized to administer oaths in the State or Territory where the claims may he situated, having an official seal, and all the testimony and proofs may be taken hefore any such officer, and when duly certified by the officer taking the same, attested hy his seal of office, shall have the same force and effect as if taken hefore the Register and Receiver of the Land Office. Whenever any contest shall arise as to the mineral character of any land claimed to be suhject to entry or sale under an act of Congress, it shall he the duty of the Register of the Land Office in which such contest is made to immediately certify such contest to a court of competent jurisdiction in the county where such land is situated, and to immediately notify the contestant and contestee thereof. Within thirty days after such notice the contestant shall file in such office a verified statement of the facts upon which he hases his contest in plain and concise language, and shall serve the same upon the the contestee, and thereafter and within the time provided by the laws of the State or Territory where such land is situated, for answering in any civil action, the contestee shall file his verified auswer to such statement, and thereupon the contest shall he tried and determined as are ordinary actions in such court, and when determined such determination shall he certified to the Register, and such determination shall he hinding upon him and shall he forever conclusive as to the character of the land in question; provided that the presence of rock in place hearing gold, silver, cinnahar, petroleum or other valuahle mineral shall be regarded as presumptive evidence that the land containing the same is mineral in character; and provided, further, that in investigating the character of the land with a view to ascertaining whether it is more valuahle for mineral than for agricultural purposes, evidence may he taken of the mineral discovered or developed adjacent to such land, proof of which shall be taken as presumptive evidence that the land in question is mineral in character; aud provided, further, that wherever land is proven to he within a well-defined mineral helt, such land shall be deemed, presumed and taken to he mineral land, unless the contrary is proven; and provided, further, that the provisions of this chapter shall be liherally construed, with a view to aid the applicant in procuring title to the mineral lands of the United States, and that the rules and regulatious prescribed by the Land Department for its government and that of its officers, in disposing of said lands, shall be so formulated and administered as to assist the Government in disposing of said land to bona fide applicants; and provided, further, that all applicants for patent for lands, other than mineral lands, upon which exists a valid mining location, the uotice of location of which, designating the section and township in which such location is situated, shall have been recorded in the office of the Recorder of Deeds of the county wherein the land in question is situated, must, except when otherwise in this act provided, give to such mineral claimant notice of such application in writing, or hy publication in the newspaper published nearest such mining location at least once a week for sixty days."

SEC. 4. That section twenty-three hundred and thirty-seven of the Revised Statutes he amended so as to read:

"SEC. 2337. Where non-mineral land not included in a lode claim is used or occupied, or is intended to be used or occupied, hy the proprietor of such vein or lode claim for mining or mineral purposes, such non-mineral surface ground may he emhraced and included in an application for a patent for such vein or lode claim, and the same may be patented therewith or separately suhject to the same preliminary requirements as to survey and notice as are applicable to vein or lode claims, hut no location hereafter made of such non-mineral land shall exceed ten acres, aud payment for the same must he made at the same rate as fixed hy this chapter for the superfices of the lode claim. The owner of a quartz mill or reduction works not owning a mine in connection therewith may also receive a patent for his mill site as provided in this chapter."

MENTION was made some months ago of the Morning mine in the Cœur d'Alene district which was worked on the co-operative plan, the experiment heing a novel one. The Chloride mine, on Rock creek, sixteen miles from Baker City, Or., is to he worked on the same plan hy J. K. Romig, tbe lessee. There is an ahundance of low-grade ore, and the plan is that, after paying the expenses of transportation and smelter charges, the net proceeds are to he divided pro rata among the mine owners, the lessee and the miners.

AN advertising medium says that the ordinary weekly has an average of ten readers to each copy printed. If this he so, it would he fair to assume that a representative journal like this paper has fifteen readers to each copy printed. On this hasis, which is helieved to he a fair oue, nearly 100,000 men read this paper every week.

Concentrates.

C. D. LANE proposes to put in a 20-stamp mill at the Mayflower, near Nevada City.

THE *Arizona Journal* reports the mountains from Fort Bowie to Turkey Creek full of prospectors.

COL. FRANK MCLAUGHLIN expects to turn the river into the canal at the Golden Feather before July 1st.

OVER $10,000 was paid out by the Kingman, Arizona, Sampling Works last week, the best showing made in two years.

A QUARTZ MILL is to be erected at the Montgomery mine, in Sailor canyon, fourteen miles south of Cisco. J. B. Campion is superintendent.

WASHINGTON, D. C., MEN have bought a half interest in the Humphreys gold property, six miles from Globe, Arizona. A 10-stamp mill will be built.

AT Coulterville, Mariposa Co., the Merced Gold Mining Co. have 150 men at work. A three-compartment shaft is being sunk on the old Coon property.

PROMPT destruction of some adjacent buildings by giant powder placed therein prevented the burning of the entire town of Downieville, Sierra Co., last Saturday.

ALTHOUGH mining has ceased at the Harqua Hala, Arizona, men are prospecting for the lost ledge. It has been found before, and miners believe it can be found again.

T. A. ENISON is said to have originated a concentrator for refractory gold ores that will save all the gold in them and to have bought a mine in North Carolina to experiment with.

THE "company store" causes threats of a shutdown on the part of the Broadwater Company, and a boycott on the part of the miners at Neihart, Montana. The monthly pay roll is $12,000.

BARON CHOISY and E. DeBourgade, who have been examining several gold properties, have returned to Paris with options on four mines with an aggregate valuation of nearly $3,000,000.

THE 10-stamp mill that was destroyed by fire May 27th at the Gold Ring mine, Grass Valley, on the north fork of the American river, three miles from Dutch Flat, will be rebuilt immediately.

CARSON, Nevada, papers say that Jas. Yerrington, who recently bonded the principal Silver Peak, Esmeralda Co., mines, has sold them to Senator Wolcott and associates, of Colorado, for $600,000.

THE report that the Kennedy, Amador Co., mine has been sold to French capitalists for $2,000,000 is denied by one of the owners. There is an option on the property but the deal is still under consideration.

A TUNNEL is being extended several thousand feet at the Green Mountain and Cherokee mines, Indian valley, Plumas Co., to strike the vein lower down. A large number of men is employed there at present.

THE 3500 employes of the Calumet and Hecla Mining Company will have their wages restored ten per cent, the amount of the reduction in 1893. Many laborers there receive but a little more than a dollar a day.

H. MCPHEAL has sold the Golden Eagle, Golden Mound and Ocean Wave, free-milling gold claims in the Harqua Hala district, thirteen miles from Harrisburg, Arizona, to G. F. McFall of Phœnix, Arizona, for $46,000.

W. H. BRADLEY has put a twelve-horse power double cylinder gasoline engine in the Chapparel mine at Julian for working a hoist and furnishing power for electric lights. The engine is located at the bottom of an 800-foot shaft.

A BAR of gold was cast at the Helena, Montana, assay office last week, being 11½ inches long, 5½ inches wide and 3½ inches deep. It weighs about 1437 ounces and its value will run from $21,500 to $28,000, according to fineness.

A. T. THOMPSON, of Phœnix, Arizona, who recently bonded some mines in the Humbug district, is instructed by the eastern company which he represents to put men at work on the development of the property and begin preparations for the erection of a mill.

ABOUT April 25 a rate of $6 per ton was made by the railway people for hauling ore from Wood river to Salt Lake. A circular just issued by the railway managers gives notice that this rate has been withdrawn, and the old rate of $8.65 restored, which is bad all round.

EFFORT is being made to secure resumption of work in the Cœur d'Alene country. The proposition is to reduce the miners' wages fifty cents a day from the old rate; the companies' mining boarding houses agreeing to reduce board and lodging from $7 per week to $5.

THE *South African Financial Record* thinks the wages of native labor in the Randt mines should be reduced and calculates that a reduction of five cents per day in the wages of the negroes working in the mines would aggregate a reduction of $500,000 per annum in the amount paid for labor by the companies.

THE two Nevada districts most prominent now are Silver Star, near Soda Springs, and Silver Peak, in the southern end of Esmeralda county. The mines in both districts are exclusively gold-producing, notwithstanding their names. The Hawthorne *Bulletin* thinks they should be called Golden Peak and Golden Star.

PROSPECTORS have developed placer mines on the Boise river, Idaho, above the mouth of Moore creek, by drifting. To construct a ditch necessary to accommodate the miners will require an expenditure of $18,000 or $20,000, and those owning the bars will make an effort to get some capitalists to built it for them.

THE absence of bar deposits from the Omaha-Grant refinery at Omaha is evident in the report of the local branch mint for the month of May says the *News*. The total receipts footed up $351,567.97 compared with $431,933.62 for the corresponding month last year. The loss equals $80,365.65 or eighteen per cent.

AT the Yellow Jacket, Idaho, mine it is reported that the total cost of mining and milling, including office expenses, etc., is $2.67 per ton. Seventy stamps are to be added to the mill and a pipe line and flume built to carry power to an electric plant. Messrs. Roeder and Searles figure that, under the new conditions, the monthly yield will approximate $50,000.

LONDON capitalists have completed an arrangement to buy the Alaska and Grizzly mine at Pike City, Sierra Co., and will develop the mines, putting on additional machinery, and probably doubling the present working force of sixty men. W. W. Casserly, the superintendent, thinks the new company will expend $150,000 on the property in new machinery and development work.

THE Secretary of the Interior has approved the recommendation of Director Walcott, of the Geological Survey, regarding work in this State. H. W. Turner will finish mapping the Bidwell Bar, Butte Co., sheet and the Sonora, Tuolumne Co., sheet. W. Lindgren will write up his report on the field work in the gold belt of California. A. C. Lawson will continue the survey of the Coast Range in the vicinity of this city.

THE Siskiyou Mining Company, incorporated in Baltimore, Maryland, has located about 500 acres of copper mining ground along the Illinois river on the west side of Josephine county, Oregon, thirty-five miles below Kerby. Men are getting out ore and cutting roads to the property. A new townsite, "Wheeler City," has been laid off, and at this point, near the junction of Falls creek, smelting works are in contemplation.

SINCE the publication last week of the charges and counter charges in the bonding of the Rawhide and other Tuolumne gold mines, the matter has been settled and the suits dismissed. It is represented that N. F. Cleary has paid the costs and given up the bond, and that Nevills, Ballard and Martin have rebonded the whole property, including the Tuolumne ditch, to E. W. Fielding, of London, for $2,000,000 for 30 days, a forfeit of $50,000 to be paid by July 1st.

THE following statement of the Tacoma Smelting and Refining Co. for May, 1895, is furnished by the Tacoma Chamber of Commerce: Number of men employed, 59; payroll, $5166.06; wood choppers and teams, $848; total payroll, $6014.06. Products —3600 bars bullion, 369,178 lbs., containing: 1862.12 ozs. gold, at $20.67, $38,490.02; 39,173 82 ozs. silver, at 67 cts., $26,246.46; 366,364 lbs. lead, at $3.07½ per cwt., $11,265.69; total, $76,002.17. Duty on imported ores paid to custom house, $2,667.43.

REPRESENTATIVES of 32,000 shares in the Bodie Mining Co. met last Wednesday at 319 Pine street, to voice their dissatisfaction with the directory and find out why the stock has dropped from $4 a share to twenty-six cents. General fraud was alleged, brokers were charged with "duplicity," and the management was unanimously condemned. The annual election is next Monday, when an effort will be made to get a majority of the 84,000 shares to unite on a new board of directors.

THE big Montana copper mining organization known as "the Anaconda" will reincorporate next Saturday as "The Anaconda Copper Co.," with a capital stock of $30,000,000, divided into 300,000 shares. The present capital stock is $12,500,000. The company now employs 8000 men, and the reorganization means augmented activity. The incorporators are the company's attorneys. It is understood that J. B. Haggin, the Hearst estate and other prominent stockholders will retain their holdings in the new corporation.

E. A. ABADIE, formerly of Grass Valley, sends the half-yearly report of the Wemmer Gold Mining Co., of Johannesburg, S. A., of which he is general manager. The net profit for the six months ending Feb. 28, '95, was over £33,000. Forty stamps in 171¾ days crushed 29,535 tons ore, an average of 4.3 tons per stamp per day. It cost 28s 10½d per ton to work the 49,573 tons ore mined; the cyaniding of 19,250 tons cost 4s 10d per ton. The receipts for the half year were 23,358½ ozs. gold, worth £83,026, and 800 tons concentrates, £16,091.

UNAFFECTED by the debris question hydraulic mining in Trinity county goes on satisfactorily. At Oregon Gulch the French company has 14½ miles of ditch, carrying water to the La Grange, and, in addition to the half-million already spent, have in contemplation the expenditure of about $250,000 more. Another enterprise, owned largely in France, is being carried on at Junction City. The ditch from Canyon creek is having its capacity enlarged from 3000 to 6000 inches. An electric light and power plant is being put in and a telephone line built.

AN Arizona writer, discoursing of "dry placer mining" in some parts of the Territory, says: "The placer machine is built on the principle of a fanning mill, eight feet long, and two men shovel the sand into the mill, and in this way handle many tons per day. When the sand don't pay this mill is taken down in sections and put on the back of a jackass and moved to a richer spot. It can be set up and put in running order in five minutes. San Domingo is one of the main placer camps. In a radius of a few miles there are over 100 men working the dry washer. The old custom still prevails. No mining locations are allowed—everybody for himself."

THE following are details of results of cyaniding concentrates at the Crown Reef Gold Mining Company, Witwatersrand, South Africa:

1894.	Assay value. Dwts.	Theoretical extraction. Per cent.	Actual extraction.	Cost. s.	d.
October	23	90.21	73 14	8	11
November	18.37	89.76	84.92	8	0.7
December	17.00	91.17	91.13	8	0.3
1895.					
January	15.25	91.80	91.67	7	3.3
February	13.75	89.09	87.86	7	11.88

Time, 13 days' treatment; about 125 pounds of cyanide was used per ton of concentrates treated.

THE Nevada City *Herald* says: A week or two ago it looked as though a big mining deal would be made here, when Messrs. Golden, Levy and Keating were bargaining for the Chapman ranch, in this district. The price set upon the property was $35,000, and it is said that this was afterwards raised to $50,000. The increase in price, or some other consideration, spoiled the trade, which is greatly to be regretted. The purchasers wanted the Nevada City's ground and works, belonging to the Gold Hill Mining Company of New York, and had they secured it, would have worked the Chapman ranch ground through the Nevada City workings. This would have made a big mine and given employment to a large number of men.

E. B. BRADEN, assayer in charge of the United States assay office at Helena, has sent a circular to the mine owners and other patrons of the office, in which he says: "The regulations of the mints and assay offices prohibit the purchase of gold bullion of less than 500 fine in gold, and of less than $100 in any one deposit. For the convenience of the public, however, this office will accept deposits of gold for melting and assaying that are 500 fine or over and of a value of $50 to $100. The same will be melted, assayed and the value determined. The charge for doing this work will be $1 for each deposit. After determining the value of these deposits, they will be returned to the depositor, or turned over to some bank for purchase and settlement."

AT the quicksilver mine at Almaden, Spain, in '94 there were mined 6680 cubic meters of ore, of which 561 cubic meters were barren. Most of this was from the crosscuts and galleries on the 12th level, and on that level most of the stoping was done during the year. The permanent work required the construction of 8309 cubic meters of masonry in the various galleries and chambers. In weight the extraction of the year amounted to 19,428 metric tons of ore and 1828 tons of barren rock. In the furnaces during 1894 there were 18,744 tons of ore treated, which produced altogether 44,521 flasks of quicksilver, representing a total weight of 1,535,988 kilos. of quicksilver, the average yield of the mineral treated having been 8.19 per cent. The furnaces ran for seven months, having been shut down through the hot season, from May to September. The highest yield reported was 8059 flasks, in December, and the lowest 2912 flasks, in October.

MEXICAN FINANCIERS say that the new mining law of that country is misunderstood; that it does not mean a new tax on mining, but a change of regulations regarding the collection of such taxes. For ten years the Mexican mints have been leased to private companies, and the Government has received no revenue from the coinage of silver and gold. The contracts leasing the mints have expired, and the Mexican Government is desirous to again control the mints. After the 1st of July the Mexican Government expects to have an income of about $2,000,000 coming from the tax on the ores and the mint tax on the bullion. The tax of $4.41 on bullion was collected by the companies controlling the mints on account of the different contracts which they had made with the Government as a lease for the privilege of coining the bullion of the country. The Mexican Government declares that the tax will virtually be less than before, but more equally distributed.

THE report of the Minister of Mines for British Columbia for the year ending December 31, 1894, gives considerable information. Some of the statistics for the year are as follows: Barkerville division—Men employed 87, Chinese and Japanese 149, average wages $3.50 and $2.50 for Chinese per day, estimated yield $66,300; Lightning Creek—Whites 27, Chinese and Japanese 100, wages $3.50 and $2.50, yield $34,700; Quesnellemouth—Whites 37, Chinese and Japanese 78, yield $26,200; Kiethly Creek—Whites 167, Chinese and Japanese 199, wages $4 to $3 and $2.50 to $1.75, yield $65,150; total for Cariboo $192,350. Cassiar—Whites 17, Chinese and Japanese 54, wages $5 to $6 and $3.50 to $4, yield $22,700. East Kootenay—Whites 41, Chinese 43, wages $3 to $3.50 and $2.50, yield $24,900; Western division—Whites 205, Chinese 3, wages $3.50 to $2.50 and $2, yield gold $67,680, argentiferous copper $73,164, silver and lead $605,534, silver, gold and copper (Trail Creek) $106,267. Lillooet—Whites 30, Chinese and Japanese 50, wages $3 and $1.50, yield $39,257. Yale: Osoyoos division—Whites 138, Chinese and Japanese 40, yield gold $65,150, silver $8,500; Similkameen—Whites 75, Chinese and Japanese 70, yield $11,805; total for Yale $76,953. Total whites employed 824, Chinese and Japanese 786. Total yield gold $393,942, silver (not including ore shipments) $8,500; adding one-third for gold carried away by private parties, the total of gold and silver is $464,566, an increase of $85,031 over 1893. The average earning per man was $283, a decrease of $21.

FROM a memorandum of the British Parliament the following information is obtained regarding the great Kaffir speculations in London: "It was only nine years ago that the English began to settle in the section of South Africa where the diamond and gold mines have since been discovered. The Dutch had previously settled there after the same fashion as they did originally in New York, when they called it New Amsterdam. About twenty Dutch farmers occupied all the section of country, whose occupation was raising cattle. The mining excitement has since drawn a white population of 60,000, and 40,000 blacks since August, 1886. Within a few years most of these lands were sold at £1 an acre, and a large part of them as low as 6d an acre. The mines established on this property have been stocked at £120,000,000, and most of them are selling at an immense premium; for instance, the Rand mines were issued at £1 a share and they are now worth £33 a share, and many of the holders expect to realize at least £100 a share. The output of gold is now 181,000 ounces per month, and with the new batteries and appliances now being erected and nearly completed, it is confidently expected that the product will reach 200,000 ounces per month. Silver is found in this country in considerable quantities, but the low price prevailing makes it unprofitable as compared with gold. This rich mining property is located 6500 feet above the level of the sea, and is extremely healthy. In the Rand Victoria mine they are now sinking a shaft to work the reef at a depth of 2200 feet."

J. L. M. FRASER, C. M. E., has made a report on the Canyon Creek, Idaho, mines to a party of prospective English buyers, in which he says the claims on the main lode for a distance of 4,000 feet have been well proved by several shafts sunk down to the 9th level, from which 88,100 tons of ore have been sold at a profit of $1,529,293. The reserves of ore above the 9th level are 173,100 tons of shipping ore, the stopes producing 35,000 tons per year, at a profit of $399,350. The shafts are sinking below the 9th level, and crosscuts will be put out south to intersect the lode at the 10th level. The width of the lode varies from 10 to 20 feet, of which from 5 to 10 feet is solid ore, and the remainder good concentrating ore. The mines are well equipped with pumping, winding and concentrating plants, at a cost of over $500,000. The workings are lighted by electricity, and the machinery is driven by water, electrical and steam power. The water rights above the mines have been located by the mineowners, and cannot be used by any other mine. The mines are well served by the Northern Pacific and Union Pacific railways, with sidings into the mines, so that transit is easy and inexpensive. By the amalgamation of these claims a great saving will be effected in the surface and underground management, also in the concentrating mills, and by using the combined water powers, equal to about $50,000 per year. The lode being a true fissure cutting through the formation obliquely, one has only to keep the ore ground well opened in advance of the stoping, and the present profits of $399,350 can be continued for many years to come. A company is being privately formed to purchase this group of mines for $1,765,000, mostly in shares, with a further $100,000 in reserve, the present profits being equal to over 21 per cent. on the nominal capital of $1,850,000.

Battery Frames.

Written for the MINING AND SCIENTIFIC PRESS by F. S. PHEBY.

One is impressed, upon visiting some of the many quartz mills of the Pacific slope, with the variety of battery frames in use and the variations which the same exhibit in height, design, position of shafting and size of timbers. In Amador county, Cal., alone, I know of at least six different designs, and have in mind two in particular, one an "A" frame with thirteen-feet battery posts, the floors of which are dark and obstructed, the feeders almost inaccessible and the cam shaft bespattered with wet ore; while the other, a knee frame with nineteen-feet posts, has every part of the battery and feeders convenient and accessible and all belting entirely out of the way. The design of a frame determines the position of the shafting, which bears with importance upon the life of bearings and belting, to say nothing of the presence or absence of menacing belts and pulleys about the working floors. The size of the frame timbers is determined by the weight of the stamp.

The knee frame, no doubt, is the heaviest and most costly, but seems superior to all, at least in solidity, position of shafting and consumption of belting. The accessible line shafting receives the most attention, the bearings are kept clean, dry and quite free from dust, while the equal and nearly opposite pulls of the main and counter belts tend to keep the shaft in good alignment. This frame also best affords an opportunity for large pulleys, which I have seen 114 inches on the line and 84 inches on the cam shafts, and practice proves that moderately long horizontal belts run without tighteners on these large pulleys wear longer and transmit with less loss than short highly inclined ones. The position of the belting overhead permits the least amount of falling particles to cut them out and leaves the floors entirely free from dangerous obstructions.

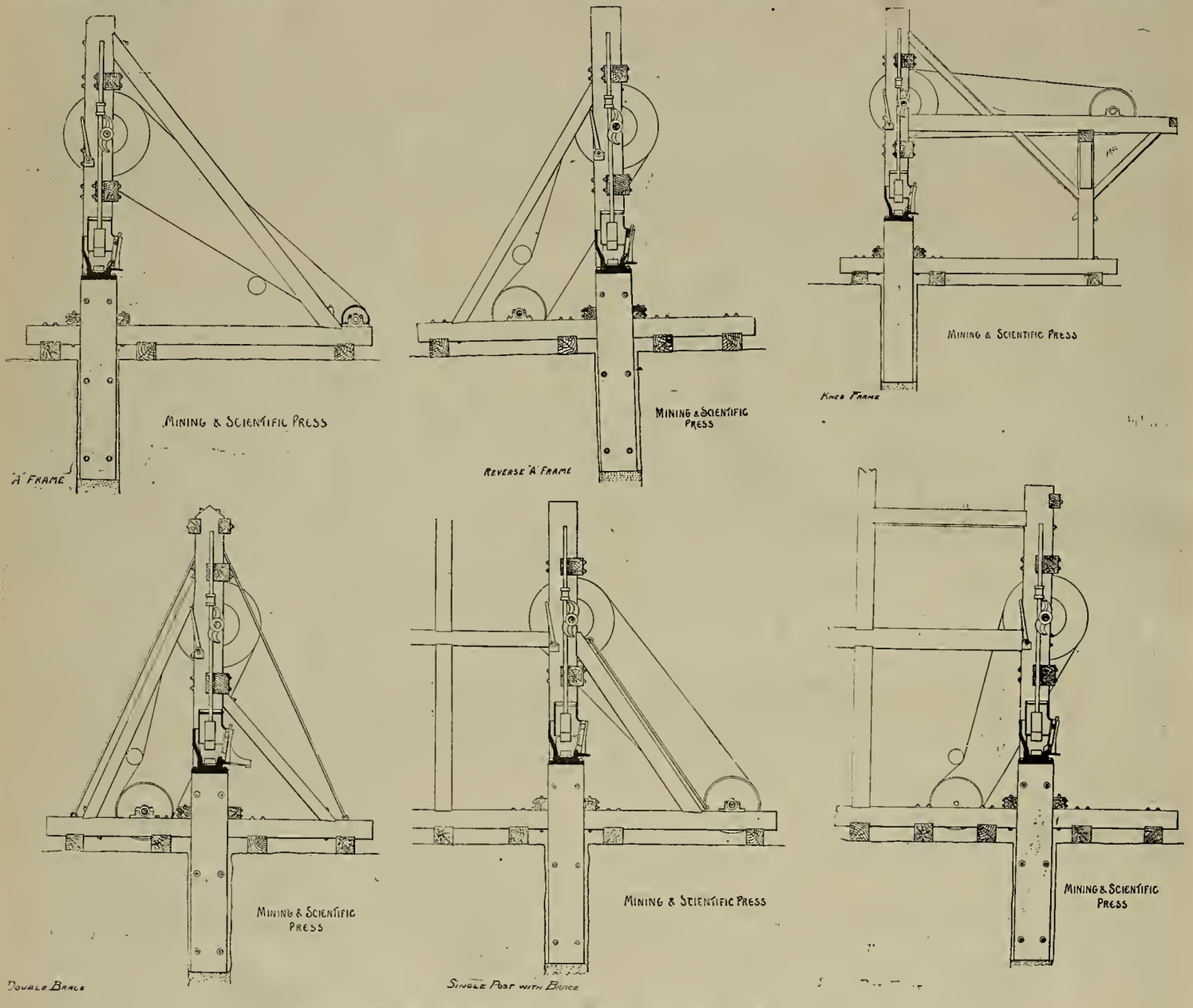
The "A," reverse "A" and "double brace" frames are commonly met with, especially in silver mills where plates are absent, and while simple and less expensive, they can be made sufficiently strong. Although the battery sills, so long as they remain sound, furnish the surest foundation for the line shaft, such a position is, in either wet or dry crushing mills, very severe on belts and shaft, the sweepings, dust and ore particles falling upon the former and more or less of the leakage through the floors upon the bearings, which in their dark, inaccessible position generally receive the minimum of attention. Whether the shafting be placed in front or behind the battery, the belting is in either case highly inclined and the distance between centers of shafting is short, even though the frame be a tall one. Short inclined belts require, on the loose side, powerful tighteners to produce the necessary friction, so as to prevent slipping on the lower or small line shaft pulleys. The horizontal and excessive vertical pulls on the main and center belts and the occasional decay of the sills sometimes throws the shaft out of line, causing the rapid wear of both itself and the belting. Generally the pulleys are small, which, together with slow speed and increased tension, necessitate a heavier belt, much less economical in cost and subsequent wear than a lighter one. Even with small pulleys considerable grading becomes necessary for a belt-way, which I have seen eight feet deep.

All that applies to the "A" applies as well to the single-post frame. This intimate connection of battery and ore biu seems a detriment, as any settling or spreading of the bin timbers reacts upon and throws the battery frame out of line. Especially is this true where large quantities of wet, gougy ore are kept constantly in the bin. I recall such a case, where the battery posts have long been out of line, to the rapid deterioration of battery and belting. Many mill builders advocate the entire independence of bin and frame.

Some frames seem to belong to no particular class, but are combinations of the few simpler forms, as the single-post with front brace. Often frames of this same class differ greatly in the height of battery posts, length of braces, etc.

A design but seldom met with is that showing the cam shaft behind the battery posts. In a double mill, with batteries placed back to back and run from the same power, it becomes imperative to build one battery of this nature as shown in the Alaska-Treadwell and the Homestake mills.

This article is not intended as a mechanical treatise, but is simply what any one might observe.



VARIOUS DESIGNS OF BATTERY FRAMES IN PACIFIC COAST QUARTZ MILLS.

Some Recent Additions to the Museum of the State Mining Bureau.

Auriferous sulphate of alumina, several tons of which were profitably worked for gold in an arrastra on Sulphur creek, Colusa Co., Cal.; J. A. Veatch.

Scolcite, Andreasburg, Germany; J. Z. Davis.

Several polished specimens of Eastern granites; J. Z. Davis.

Fine specimen of Indian carving in serpentine, ornamented boat-shaped dish or bowl. Found in a bluff on Coquille river, Oregon.

Quartz breccia, very handsome colors and taking a high polish; Monterey Co., Cal.

Native mercury in volcanic mud, from the thermal spring belt at Calistoga, Napa Co., Cal.

Gold quartz, very rich in free gold, British Guiana; W. H. Storms.

Gold in calcite, Santa Rosa mine, Mariposa Co., Cal.; E. H. Cox.

Griphite; a new mineral, South Dakota.

Chondrodite in fine crystals, Tilly Foster mine.

Chinochlore in fine crystals, Tilly Foster mine.

Cobaltite (crystal), Sweden.

Rich tin ores, Durango, Mexico.

Bismuthinite, Wickes, Montana; F. W. Traphagen.

And a number of other specimens; also about twenty-five species of fossils illustrating the cretaceous formations of Shasta and Orange counties.

HENRY S. DURDEN, Sec'y.

A Question and Answer.

To the Editor:—Please answer through the columns of your valuable journal the law governing the following case:

Blank creek carries two thousand inches of water during the mining season. A has the first and second water rights, being a high and low pressure ditch—about one hundred feet vertical height between the two ditches. A's locations call for five hundred inches each.

Can B locate above A's first right or is B compelled to go below the second right, or can B locate any water right on the stream?

I contend that as long as there are one thousand inches of water going to waste that I can locate five hundred inches above A's first right and not interfere with his full supply, etc. SUBSCRIBER.

Starveout, Douglas Co., Or., June 8th, '95.

The above was referred to Mr. J. M. Wright. The question and answer being of general interest to the mining world, are given publicity.

Mr. Wright replies as follows:

The position taken by your correspondent at Starveout, Oregon, is correct; that is to say:

Of any stream on the public lands and subject to appropriation, any one may appropriate any of the waters not already appropriated. It is necessarily implied that a later appropriator cannot diminish or otherwise interfere with the full supply of a prior appropriator.

The subject is well illustrated by the following language of the Supreme Court of California in the case of Falkner vs. Rondoni, 104 Cal. 147:

"The testimony shows that plaintiff's ditch has its head below the junction of the two forks of the stream; that during a portion of the year there is sufficient water in the stream for all the parties; that the north fork is the principal or larger branch and furnishes most of the water; that prior to 1891 plaintiff had plenty of water, or when it became short defendants, upon being notified, turned it down.

"It came, no doubt, mainly from the north fork, but this could make no difference to the plaintiff. *It was thirty-one inches of water to which he was entitled*, and he was not injured, and could not complain that it came from one branch and not from the other.

"*There was no invasion of his rights, and he had no ground for action so long as he received the quantity of water to which he was entitled.*" Yours very truly,

JOHN M. WRIGHT.

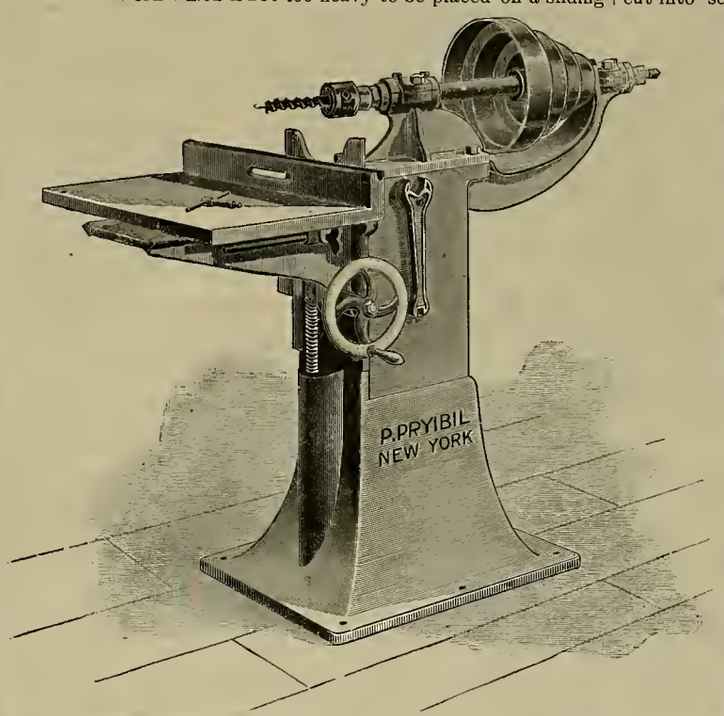
San Francisco, Cal., June 10th, '95.

Between November and May.

There has been nothing like it known on the stock markets. Nothing like what? Why, of course, the Kaffir boom. From about the end of October down to the very hour at which we write there has been a volume of business such as the mining market has never known, such as the markets generally have never experienced. Talk of American rails, talk of general Yankee securities, talk of English railways, talk of foreign loans, talk of anything you please, and the business in these has been as nothing compared with what it has been in Kaffir shares. The public in this case has been the veritable leech—crying "give, give," and the market has given, and the supply is scarcely sufficient to feed the appetite for paper that almost seems to grow by what it is fed on. The public has been prepared to part with their golden sovereigns for transfers and certificates, and in innumerable instances they have made money by the exchange. During the last two months there has been built up many an enormous fortune that would not have existed but for the Kaffir boom. The hill and country sides of days to come will be dotted with the palatial residences, the country seats, and the more moderate villas of those who, by reason of what they did between October, 1894, and May, 1895, have been able to retire from the maddening crowd, and to pursue their course, as Gray would say, "along the cool, sequestered vale of life," thanks to their dealings in Kaffir shares. For the rest of their lives they will be able to regard the weary mortals, less successful than they in the speculative race, with that pity, or that contempt, which humanity or pride may engender. They will, if humane, behold with pity, struggles in which they would have had a share but for those lucky months between October, 1894, and May, 1895. Or in their pride they will say, "What asses these people have been; if they had had our brains they would have been where we are—in our comfortable villas, in our noble mansions, in our carriages, not to say on our horses." The race is not always to the swift or the battle to the strong; and sometimes the man with very poor brains, by a series of lucky chances, gets to the top of that greasy pole of fortune, which others, in attempting to climb, have missed, and come down with a run, making their last state worse than their first. For, of course, if these enormous profits have been made by some people, there have been enormous losses made by others; and thus it comes to pass that we all prey on, instead of pray for, each other. This is a sort of homily that suggests itself to us when we see the purse-proud men we meet every day in the city, whom the tens of thousands for which they can sign checks cannot make gentlemen, because the instinct is not there. Yet are they the spoilt children of fortune, and vulgarians though many of them be, it is to these lucky ones their fellows do obeisance, without in their hearts feeling towards them the slightest atom of respect. Money has got for them everything that money can buy; but, after all, there is a point beyond which money cannot go. It cannot buy respect; it cannot make the *parvenu* a gentleman. It may command subservience, but cannot command respect; and well do these *parvenus* know it. But to many a man, out at elbow almost in November, 1894, the interval to May, 1895, has meant a rapidly acquired fortune, very possibly to be lost in the next round of speculation.—London Mining World.

Fixed Spindle Boring and Mortising Machine.

The machine herewith illustrated is designed for work which is not too heavy to be placed on a sliding table and moved up to the bit. The table has a vertical movement of ten inches, slides forward and back, and, when made for mortising, sideways also. Adjustable stops limit the extent of these motions. Mortising is done with a tool cutting on both end and side, producing, when the work is moved sideways, mortise with half-round ends. The counter-shaft has self-oiling loose and tight pulleys, seven inches diameter for a three-inch belt, and should make about 1000 turns per minute.



FIXED SPINDLE BORING AND MORTISING MACHINE.

California Clays — Stove Lining.

To the Editor:—New fields are being opened and developed for the use of several mineral products of this State—among others, the use of fire clay as a stove lining. The clay used is a species of kaolin, which is more tenacious and better able to resist fire than common clays. It is made into a dry cement by mixing with asbestos a fireproof "binding" material, and applied to the stove as a mortar. A lining thus constructed has many advantages over the old fire brick, as it fits any stove or furnace, does not crack readily, is more conveniently applied, and is much cheaper.

The great number of uses for such a cement opens a large field for California clays. Eastern products are constantly being replaced on this coast by home products simply because of their superior merits. The writer wishes to call the attention of all clay dealers to the fact that the varieties of color, weight and cohesive strength of California clays are almost infinite. Paint dealers can find any shade of clay or metallic, which can be used as a pigment. Some varieties of clay are as light in weight as their bulk in light wood, while others have a specific gravity nearly equal to that of a common brick.

California clays are cheaper and far superior to others in quality. This is one of the many illustrations which have lately become so numerous, showing that our natural resources are sufficient. All they need is development.

The completion of the San Joaquin Valley Railroad, coupled with the efforts of the Half-Million Club and the Manufacturers' Association, will eventually open the undeveloped resources of this State and place California far ahead of her present commercial rivals.

CARROLL B. SMITH.

San Francisco, June 8, 1895.

Some Practical Experience.

To the Editor:—In the interest of mining, and particularly in so far as the industry applies to Del Norte county, I desire to say that last fall I commenced operations on a river bar on the main Smith river, in this county, about two miles below the old Myrtle Creek mine, and about ten miles above the mouth of the river. I put on a No. 2 Hotchkiss giant, using 600 feet of nine-inch pipe. I took water from a small stream (Rock creek) by means of a flume. I worked in pay dirt fifty-one days and took out 35 ozs. 17 pwt. of gold and 1 oz. 4 pwt. platinum. I realized when I commenced work that I had only what might be properly called low-grade gravel, but the results were very satisfactory. I worked only two men. I made some innovations in the preparation of my sluice for saving fine gold. I bought railroad iron—that is, the common "T" rail—had them cut into sections the width of my sluice or thereabout, my sluice being twenty-two inches. I cut my rails into sections twenty-one and a half inches long, and laid in the sluice just as close as possible, and lined down the same as blocks. I had about ten feet of this kind of riffle. I carefully observed the work of the iron riffle as a gold saver, and am satisfied that more than four-fifths of the gold saved was taken from the iron riffle. I am not aware that the "T" rail has ever before been used. I am certain that it is not in common use, but any one who will be at the bother and expense of giving it a fair trial will be satisfied with its work, and its durability makes it all the more desirable. I placed my iron riffle at the head of the sluice and used six-inch blocks below, placed in the usual manner, but the "T" rail used by me was only three and one-half inches high, so that it became necessary for me to put in a false bottom in the box using the rail in order to bring the top of my rails even with the top of the blocks. The shape of the top of the rails make a perfect riffle—one that never packs and keeps the quicksilver always exposed.

Mr. Editor, I thought it only right that the miners of California should know the result of my experiment with the "T" rail, and I know of no better way of informing them than through your valuable paper. We have thousands of acres of the same kind of gravel in Del Norte as that worked by myself during the past winter. Yours very truly,

R. W. MILLER.

Crescent City, Cal., June 10th, '95.

Aluminite in Yuba Co.

To the Editor:—About two miles from this town there is a deposit of aluminous clay, and, as far as I know, it is the only such deposit in this State. The deposit was found accidentally in prospecting for copper and seems to be of very large extent. A tunnel was run 190 feet into a hill and this goes through a clay bed twenty feet wide. The clay crops out on the surface eighty feet above the tunnel at this point. About 1500 feet northwest of the mouth of the tunnel there is a shaft ninety feet in depth that was sunk in 1860 by some parties prospecting for copper. This shaft shows the clay from top to bottom. There is every reason to believe that the clay bed extends without a break between the tunnel and the shaft, and how much more there is of it nobody knows. The clay on the dump at the tunnel will average 50% oxide of aluminum. I send you some samples which were picked from the dump.

It seems too bad that this deposit cannot be made of some advantage to this section of the country. There is an abundance of wood and water at hand.

JOHN DEMPSEY.

Smartsville, Cal., May 31, 1895.

The sample sent with the above has a higher percentage of aluminum than that ordinarily received with similar communications. It is an alumnite or sulphate of aluminum, and contains 30 per cent alumina. Aluminum is widely diffused in all clays, but the silicate forms the same problem in this case that the black sand does in the case of the fine gold contained therein. In more advanced metallurgical conditions, it is possible that such deposits as the subject of the above will be utilized; but so far, the

sources of the mineral in commercial quantity are so few, and the process of extraction so comparatively complicated, that only the limonites and diaspores are found practicable.

Much has been done in this regard in the last ten years, bringing the price down from $12 per lb. to less than 60 cents, and workers in the metallurgy of aluminum deem it likely that the limit has not yet been reached.

Cyanide Practice.*

By ALFRED JAMES.

This paper deals with the following branches of modern cyanide practice: The preliminary investigation of samples, plant and extraction.

In testing works, a sample is first examined, and, if in the crushed state, panned to ascertain the nature of its contents. Ores are usually ground to pass a thirty-mesh sieve, and extraction tests are made at this fineness and compared with reaults obtained by finer grinding; tailings and concentrates are tested as received.

The usual practice is to take 1000 grains of the sample and to agitate this over night with 500 grains of 0.5 per cent solution of cyanide in a twelve-ounce corked bottle, secured to a revolving shaft. On the followiug moruing the solution is filtered off, and the consumption of cyanide is ascertained by titrating a measured part of the solution with $\frac{N}{10}$ standard Ag NO_3 solution. The sample is then washed, the remaining filtrate and washings are evaporated with litharge, and the gold in solution thus determined. The treated sample, now termed the "residues," is also assayed.

If the cyanide consumption has been heavy—say over 0.15 per cent on the ore—1000 grains of the latter are tested for acidity by means of a dilute standard solution of caustic soda. Occasionally, it is found that better results are obtained by roasting certain ores than by treating them in the raw state.

After a general idea of the behavior of the sample has been gained by the "bottle test," percolation tests are made in glasses or barrels, according to the size of the sample employed. Before proceeding to erect a plant, these small tests should be confirmed by experiments on larger quantities—say oue-half to three tons. It must be borne in mind that the consumption of cyauide is invariably greater in test experiments than in practice. It has been found iu New Zealand that in actual work only one-third as much was used as was indicated by laboratory tests, which experience has been borne out by treating tailings in South Africa. On the other hand, practical extractions are usually higher than those in the laboratory.

The plant usually consists of percolators, reservoirs, and extractors, to which, if necessary, agitators are added, these latter beiug, however, very seldom used. Sufficient percolators must be provided to carry out the operations in accordance with the result of the preliminary investigations; thus, if it is found necessary to percolate and wash for two and a-half days, and filling and emptying takes half a day, each vat will receive a fresh charge every three days; and if a plant is required to treat 100 tons per day, it will need three 100 ton percolators, or six 50 ton ones, with, in each case, one additional for contingencies; or in practice, four 100 ton, or seven 50 ton vats, as the case may be, the larger size being generally preferred.

Agitators are either cylinders with an upright shaft in the centre, to which blades are attached, or else revolving wooden barrels. The fact that all such apparatus consumes power is, however, much to its disadvantage, so that preference is very generally given to the percolation method.

Percolators are either brick and cement pits, steel vats coated with asphalt varnish (used in the United States), wooden vats or rectangular wooden tanks.

It is usual to allow thirty cubic feet of vat space per ton of ore couteuts, with an additioual depth of nine to twelve inches for filter space, &c. Rectangular tanks are made of 9x3 inch deals, tongued and grooved, and bolted together by $\frac{3}{4}$ inch bolts, and are well braced aud strutted to keep them rigid. These tanks may be of any size between 11x9x3$\frac{3}{4}$ feet and 24x16x5 fect. Most of the earlier plants were constructed of this shape.

Circular vats are made of staves from 3 to 4 inches wide, well planed, and shaped truly to the radius of the vat. The bottoms are made of 12x3 inch planks, held together by $\frac{3}{4}$ inch bolts, the vats being hooped with $\frac{3}{4}$ inch to 1 inch round iron. Filters of various materials and construction have been used. Now cocoanut matting is generally used, laid on a framework of slats, and caulked in with a ring of rope, unless vacuum suction is employed, when cotton twill or canvas is preferred for the actual filter, which is protected by cocoanut matting and wooden slats above it. Discharging doors are provided in the sides or the bottom of the vat when the sides of the latter are over 4 feet high.

The reservoirs are constructed in precisely the same manner as the percolators, except that they have no doors and no filter bottoms. They should be of sufficient capacity to contain at one time all the solutions—strong and weak—in circulation in the works. As a rule, their capacity is one-third that of the tanks.

The extractors are long boxes, or troughs, coutaining trays on which the zinc shavings are laid, the solution being compelled to pass always upwards through the successive trays by means of baffle-boards. There are usually 10 zinc compartments, each compartment being designed to hold 1 cubic inch of zinc for every ton treated per month. Thus a 2000 ton per month plant would have extractors with compartments capable of holding about 2000 cubic inches of prepared zinc, equal to a space of about 15 inches wide, 15 inches deep, and 9 inches long (in the direction of the length of the extractor). The whole box should have a fall of 1 in 20. Of the 10 compartments, only six are usually filled with zinc. In each there is fitted a tray of wire gauze of about $\frac{1}{8}$ inch mesh; the lower part of each compartment is closed by a plug, protected by an iron launder carefully locked. An extractor for a 2000 ton plant would measure 12 feet long, 18 inches wide, and 2 feet 6 inches over all. There are usually three extractors to each plant.

In addition to the above, a plant usually contains vacuum apparatus, pumps, settling tanks, pipe lines, launders, a melting furnace and assay laboratory, a lathe for turning the zinc shavings' and a proper water supply.

The ore may be wet crushed in the stamps, or dry crushed in rolls or Grusonwerk ball mills. When wet crushing is used, means must be employed to get the pulp into the percolator in a leachable condition—that is to say, that slimes must be separated out by settling-pits, buddles, spitzkasten or spitzluten, the slimes being set aside for after-treatment. If necessary, an alkaline wash is then run in, and, either with or without an intermediate clean-water wash, the "strong" cyanide solution is run on. This is usually 33 per cent of the amount of the ore, and may contain 0.3 to 0.7 per cent KCy. When this "strong" solution has been run through and the top of tbe charge appears dry, the "weak" solution, usually containing 0.05 to 0.15 per cent, is run on. Some years ago the addition of haloid salts of cyanogen was attempted, but it was found that with neither ores nor tailings was there any improvement in results, while there was an increased consumption of cyanide.

After the "weak" solution has percolated, which is usually hastened by the application of vacuum suctiou, the charge is washed with water; the amouut of such washing should be about one-third the weight of the charge, and these water washings should be run through a special extractor. The residues are then either sluiced out or discharged by hand.

Each solutiou is run by launders to its own extractor, and the contents of each, in both gold aud cyanide, are regularly tested. The reactions in the extractor are very complex, and at tbe start do not proceed as well as later on, when regeneration of the cyanide takes place to a certain extent. Many of the reactions appear to be due to the formation of a galvanic couple between the zinc shavings and the precipitated gold. The consumption of zinc is about $\frac{1}{4}$ lb. per ton of ore treated; in some cases it is claimed to be only two ounces. As a general rule the solutions leaving the extractor should assay less than $\frac{1}{2}$ dwt. of gold per ton. Under favorable conditions, this has been reduced for all solutions to under two grains per ton in regular, steady work. These figures show that zinc precipitation is effective with extremely dilute solutions. Various other precipitants have been suggested, such as aluminum, zinc dust or fume, sodium amalgam, and electricity, but with the possible exception of the latter, none of these suggestions appear to have made any headway in practice.

In cleaning up the extractor, it is first washed out with clean water, then all the gold slimes are separated from the zinc by working through a forty-mesh sieve, the cleaned zinc being put back in the first trays. The gold slimes are collected in a bag of twill, well settled, and finally fused in plumbago crucibles with fluxes that are varied according to the condition of the slimes. The slags are crushed to recover the gold they contain. The melted base bullion may be improved by granulating, giving it a sweating roast in a muffle, and remelting, when it will be bright and ductile.

* Read before the Institution of Mining and Metallurgy, May 15th.

Wages in the Lake Superior Copper Mines.

TO THE EDITOR:—That the expert miner who has beeu brought up in the Lake Superior iron and copper mines, where mining is doue in a scientific manuer, will not work for low wages if there is a possible chance of improving his salary, is shown by the fact of the present immigration of some of the best miners to the Western mines. The miners and mechanics leaving are principally Cornish, Irish and Germans; these have been thoroughly educated to mining work and can always command maximum pay wherever their labor is required.

That the Lake Superior miner and laborers about the mines are underpaid is not contradicted by the manager of the mines. The extra cost for fuel, light, and for heavy clothing to resist the extreme cold of this northern latitude, makes it very hard to provide for a family at any wages less than $2 per day. As it is, many laborers receive only a trifle over a dollar a day.

The Calumet & Hecla, the most liberal of all the Lake Superior mining companies, has had to retrench in the matter of expenses; and while this company did not make any reduction in wages since the 10% cut in 1893, it has curtailed its labor pay roll very extensively both by discharging a large number of men and the hiring of boys to do the work that was formerly done by men. An official who ought to know states that the average wages of employes of this great company, taking mechanics and all departments, was uow under $40 per month.

The great depth of the mines making the production of copper more expensive will probably prevent an iucrease in wages, uuless the price of the metal goes to where the mines can pay regular dividends.

A. F. ISLER.

Coast Industrial Notes.

—L. Grothwell has finally securcd a franchise for an electric street railway line in Napa.

—The Columbia Telephone Co. have begun the construction of a telephone line from Sacramento to Placerville..

—The Fair syndicate wheat stored at Port Costa, aggregating 179,000 tons, is heing loaded for sbipment to Liverpool.

—The whaleback City of Everett has been chartered by the Panama Railroad Company to carry freight between Panama and San Francisco.

—The Reward Gold Mining Co.'s quartz mill for their Inyo Co. mine, building at the Golden State and Miners' Iron Works, is ahout completed.

—The McNear shipping firm has purchased the eleven grain warehouses in the Fresno end of the San Joaquin valley formerly owned hy the Grangers.

—Commodore Mathews, Chief of the Bureau of Yards and Docks of the Navy Department, reports that the Mare Island dock can be enlarged to accommodate the largest ships in tbe navy.

—Marshutz & Cantrell are fitting up a douhle hoisting engine for a Port Blakely, Wash., lumher schooner, and this week sent a logging engine to the Miami Sawmill Co., at Madera.

—The pneumatic gun battery in the Presidio is about completed. To enahlo the contractors to secure adequate water supply the War Department has extended the time to Nov. 27th, '95.

—The Detroit Copper Company, at Morenci, has egineers surveying a railroad line from that point to Solomonville where it will make connection with the Gila Valley, Globe and Northern.

—English buyers aro hidding for all the '95 salmon they can secure, and an extonsive operator states that 100,000 cases of Columhia river salmou will find a market in that country tbis season, as compared with about 30,000 cases last year.

—A contract for 6,000,000 feet of hemlock, to he used in the manufacture of paper, has been let to parties on the Lower Columbia. It is claimed that hemlock makes a superior quality of pulp, owing to the whiteness of the fihre and freedom from pitch. Hemlock, hithorto considered worthless for almost any purpose, will now take rank with cottonwood or spruce as a pulp material.

—Tests at Los Angeles to determine could the petroleum produced there he rofined to an oxtent that would yield a profitable distillate which could ho used for stove hurners, gasoline engines and for lubricating purposes are reported to have resulted satisfactorily. It is estimated that seven-eighths of all the oil consumed in Los Angeles is produced there. The wells employ 350 men.

—The Girard Water Wheel Company, 34 and 36 Main street, this city, have manufactured and are now shipping to the Ontario, Cal., Electric Company, two 100 H. P. water wheels, to he operated at a speed of 360 revolutions per minute under an effective head of 160 feet. One of the wheels is to drive a 65 K. W. G. E. Multipolar R. R. Dynamo, and tbe other a 60 K. W. Alternator, for electric lighting.

—San Diego City wants hids for the building and sale to it of a water-distrihuting system, according to plans furnished by Capps & Shaw. That municipality also wants proposals for the sale of 1000 miners' inches of water, continuous and perpetual flow, to he delivered at an elevation of not less than 475 feet above sea level. The San Diego Flume Co. gets $107,000 annually from thc city for water service, hut new arrangements are to he made.

—According to J. D. Culp, of Santa Clara, the tobacco-growing industry of California will soon "boom." He claims that California is hound to become one of the hest tohacco-producing States in the Union. Recently ho brought the matter to the attention of the committee on new industries of the Manufacturers' and Producers' Association. Mr. Culp says he is already making hig shipments of leaf tohacco to Eastern manufacturers. Some time ago an English syndicate offered him $300,000 for his plant and mothod of curing.

—Another company has heen organized in Oakland to construct and maintain telephone lines in Alameda county. These independont companies are making matters lively for the Bell Company and forcing prices to a normal level. In the East and middle sections of the Union, local companies bave forced the Bell people to reduce their rates from 25 to 50 per cent. In some places reported—notahly at Holland, Mich.—the Bell Company made their subscribers a flat rate of $12 a year to "freeze out" local competition. Telephone charges have heen too high on this coast and must come down.

—The Navy department iuvites bids for the construction of the three torpedo hoats authorized hy the last Congress. The plans for the hoats have heen completed. They provide for construction of the fleetest craft that will be horne on the naval list. The minimum speed must not he less than twenty-six knots per hour, though it is prohable from the amount of steam power to be supplied that this limit will he surpassed hy perhaps two knots. The new hoats will be of 180 tons burden, 170 feet long and 17 feet broad. This is ten feet longer and one foot hroader than the hoats last contracted. They will have triple expansion engines and three boilers, giving 3200 horse power. For their construction Congress has appropriated $175,000 each, hut as $25,000 must be retained in the case of each hoat for its equipment with torpedo tubes and ordnance, the limit of the availahle appropriation is only $150,000 each. This is a small amount in view of the size and speed of the boats. No premiums will he allowed for speed in excess of twenty-six knots, hut there will he penalties imposed for deficiency in this respect, and this may have the effect to increase the amount of the hids. Eastern shiphuilders are harred in this competition, for, hy the terms of the act of Congress, one of the boats must he huilt on the Gulf of Mexico, one on the Mississippi and one on the Pacific coast, provided hids can he secured from these sections "at reasonahle rates," which can very probably he done.

Scientific Progress.

Telegraphing Without Wires.

A present effort is making on this coast to send telegraph messages a distance of 18,000 miles by the use of heliographs, spherical mirrors, reflecting a ray of sunlight. The most northerly station will be at the summit of Mount Nelson in British Columbia. The southern end of the line will be some mountain in Mexico. A number of heliographs will be employed and parties will be stationed on mountain tops along the line. Messages have been successfully sent a distance of 200 miles by this method, and the experimenters have no doubt of its success. The code used will be the regular dot and dash system of the Morse alphabet. It is asserted that a message can be sent this distance and a reply received in two hours.

The heliographic system has been used extensively by the signal service and many times has served an excellent purpose in conveying information of importance. This plan of flashing messages from one station to another to be repeated along the line to distant points is an improvement over the ancient system of conveying information by fires, smoke and semaphores. The heliographic outfit is as small and easily portable as a common photographic camera and can be set up anywhere. It requires sunlight to work it, but it is rapid in its operation, the signals being easily sent and received. A small key something like that of a telegraph key operates a small shutter which covers an opening in a diagram through which the reflected rays of sunlight are flashed. The messages are received by observation with the naked eye, or, where the distance is very great, by the use of a field glass.

A modification of this method is used by naval vessels where the electric light is employed instead of the heliograph.

The Value of Tests.

Unfortunately all tests are not reliable; but, says *Machinery*, in addition to the unintentional errors which occur from an incomplete conception of the requirements of the case, or from the difference in conditions too often overlooked, we find numerous instances where tests have been made with a very evident intent to deceive, either by actual misrepresentation or what is fully as bad—the omission of some important data which would greatly modify the result.

One instance recently came to the writer's notice which will serve to illustrate the latter method. Two engineering appliances, which we will style A and B, were in use in a plant where the duty was particularly severe. One gave much better results than the other, but neither all that was claimed, owing to the rigorous conditions imposed. The makers of the one (A) giving the poorer results employed an expert, who was a recognized authority, to make a comparative test for the purpose of showing the superiority of that appliance. The test in this case was decidedly against A, so the expert visited another plant where the conditions were less severe, and made a test which naturally showed more favorable results for A than the results showed by B in the first test, leaving the public to infer that both tests were made under similar conditions; and there is little doubt that many sales have been made and medals awarded on the strength of such results.

A test which does not give all available data bearing on the subject, and which is not conducted fairly and accurately under similar conditions, if for purposes of comparison, is of little value to any one.

Prof. Weber has lately given the results of a number of experiments made by him to determine the temperatures of filaments in electric incandescent lamps. He has found that the normal temperatures of all species of incandescent lamps is approximately the same, and is comprised between 1565° and 1588° C. In the case of some lamps giving a very brilliant light—that is to say, with very thick filaments—the temperature is 40° higher. —Scientific American.

Protection of Iron and Steel.

The Gesner method of protecting iron and steel from rusting is described in *La Revue Scientifique*. The principle of the process consists in forming on the surface of the metal treated a double carbide of hydrogen and iron, which is extremely hard and adhesive. In carrying out the process the articles must first be thoroughly cleaned from rust, but it is not so essential that all oil or grease should be removed from their surfaces. The treatment is effected in a pair of gas retorts, set side by side, and raised to a temperature of from 600° to 700° C. The articles to be treated are placed in a retort for about twenty minutes, when a current of hydrogen is turned into the retort and kept on for forty-five minutes. Then a small quantity of naphtha is introduced, the supply being kept on for ten minutes. The naphtha is then shut off, a current of hydrogen being turned on for fifteen minutes longer, when the process is finished. All that remains is to cool the retorts down to 400° C., and as soon as this temperature is reached the retort lids can be taken off and the product removed. The coating thus produced has a blueish color, and it is stated to be so adherent to the metal that a treated bar can be bent through an angle of 45° without disturbing it. The thickness of the protective coating is not stated.

Back Number Advice.

A homily on getting along in the world is going the rounds, addressed to mechanics, in which the well-known extract from a speech of Garfield, advising every man to have a business of his own if only a very insignificant one, was used as a sort of text. The writer evidently did not realize the fact that Garfield delivered that speech to the farmers about a quarter of a century ago. How could mechanics follow that advice without discarding their trade and learning some other means of earning a livelihood? And what would become of the great shops, railways and industrial corporations if all the artisans whose knowledge and skill they depend upon should decide to go in business for themselves, even if compelled to move to the arid West, where lands are cheap, and start a farm on the irrigation scheme? The owners would also have to seek new fields. Whether good or bad, the present system forbids such a plan. And it is as certain as anything can be that we are getting farther and farther away from the customs, business conditions and relations which made Garfield's advice wise as society and commerce were then constituted.

Dr. Deninger of Dresden has prepared carbon monosulphide CS pure for the first time, and finds that, instead of being as described in the textbooks, an amorphous red solid, it is really a colorless gas. He prepared it by heating dry sulphide of sodium with chloroform, or, preferably, iodoform, in sealed tubes to 180° C. The gaseous products were made to bubble through aqueous caustic potash, which absorbed the sulphuretted hydrogen, and the carbon monosulphide passed through unabsorbed By acting upon carbon disulphide with sodium, in the presence of some aniline, the new gas was also obtained. It is colorless, and easily condensable to a clear liquid, which, however, rapidly evaporates. It burns in air with a bluish flame to form CO_2 and SO_2. It is extremely explosive, and was only with some considerable difficulty analyzed and found to have a composition equal to CS.

Mechanical Progress.

Power Absorbed by Rope and Belt Transmission.

The Societe Industrielle du Nord de la France recently carried on a series of experiments on a large scale to determine the comparative efficiency of ropes and belts in the transmission of power. In the programme of tests, it was laid down that "with a constant resistance, and a power charged to overcome that resistance, every variation of the power must be credited to the means of transmission, which are alone capable of modifying the regime." The resistance was obtained by incandescent lamps, which were fed by a constant number of watts. The power was provided by the steam engine, and was calculated from the indicator diagrams. The output of the dynamo was measured as follows: The difference of potential at the terminals of the back of lamps was read on a torsion dynamometer which gave indications to ¼ or ½ of a volt. The current was maintained constant by a very sensitive galvanometer.

The readings were taken by the Poggendorff method of reflection, and the method was such that it was necessary to decrease the sensitiveness of the galvanometer in order to keep the spot of the light on the scale. The galvanometer was connected to two points about one meter apart on the main circuit, and was provided with a commutator by which the current in it could be reversed to correct any possible variation in the zero point. It was not sought to determine exactly by this method the number of amperes passing, but only to be certain that they were at all times the same. The net result is stated to be that ropes and belts are equally efficient organs of transmission. The difference between the best and the worst of the figures is so small that the order might be reversed in another trial from local or other accidental circumstances. It is also to be noted that both the ropes and the belts were quite new, a circumstance that would tell more severely against the latter, as they would not have time to come to a good bearing surface, and hence would need to be run at a higher tension than would be required after some days of steady work. The slip of the belts, too, would have decreased as they became more supple and lay in more intimate contact with the pulleys, and their efficiency would probably have increased somewhat more than that of the ropes, so that they would, at least, have equalled them in economy.

A "Cranky" Belt.

There are mechanics who believe that belts will sometimes get tired and cranky, and refuse to work. Whether this is actually true or not, the writer operated a little cross belt at one time that acted very much like it. At intervals of several days the belt would fly off without provocation. I would put it on, and immediately it would fly off again, and would keep on doing so for a number of times. Finally however, it would resume operations in the regular way without any more breaks, for days at a time, when it would take another fit and do the flying-off act again. I got used to it, and when it took the notion to fly off I curbed my temper, drew upon my reserve of patience, and as often as it flew off I would quietly put it on, knowing that when the fit was over it would resume work, and it always did. I did not then know what caused the trouble, and do not yet, unless it was of a cranky disposition, or was tanned from the hide of a Texas steer.

The cause of the trouble in the above case was more probably due to the repulsive force of static electricity than any cussedness of the leather, or the source from which it was obtained. A dry leather belt working on a dry pulley, where the shafting and machine are well insulated, accumulates static electricity most rapidly, and frequently sparks 10 inches in length can be drawn from the belt. As the belt and the pulley are both charged there is some repulsiveness between the two, and it is probable that with the pulley electrified and a layer of air between the belt and pully it would cause it to fly off as above related. When the electric conditions are so favorable there will be trouble with the belt. Exhibitions of "crankiness" in machines or apparatus can always be reasonably explained by well known facts.—Saw Mill Gazette.

An Automatic Typesetter.

A new typesetting machine, called the Plectrotype, for which wonderful qualities are claimed, is announced from Berlin. Its operations are automatic, the copy being fed into it in the form of a specially prepared slip of paper. A small electric motor drives each machine, which easily turns out 20,000 ems an hour. An ordinary compositor seldom sets more than one-tenth of this amount. A single boy can attend to several of these machines at once, as his duties are merely supervisory. Not only does the strip operate the keys of the machine, but the spacing is also done automatically, so that the lines come out exactly even, or justify, as a printer would say, without manual labor. The type, after being used, is distributed automatically. Copy for the plectrotype is prepared on a typewriter, which punches in the paper holes something like those required by the Wheatstone and other automatic systems of telegraphy; and corrections may be made in the matter by the editor before it goes to the machine. However, this punching of a tape is handwork, and can hardly be performed any more rapidly than the operation of one of Mergenthaler's linotypes by an expert. In both cases there is the same limitation—a human operator's skill at a keyboard. The Mergenthaler machine (an American invention) casts a line of type from little brass moulds, which are assembled by touching the keys; the new German apparatus sets old-fashioned type. It is claimed, however, that the latter machine will handle all of the ordinary sizes of type equally well, while a Mergenthaler is specially manufactured to mould brevier, minion, nonpareil or agate, and separate machines are therefore required for the various styles.

"I saw a handy contrivance for punching boiler sheets the other day, that is so inexpensive that any shop can well afford to have one," says J. H. Allen in *Dixie*. A track of light rails was laid on the floor in front of the punch, and on this traveled a carriage of such height that a sheet, placed upon it, laid on the proper level for punching. Bolted to the floor is the rack with teeth of a pitch equal to the spacing of the rivet holes. On the carriage is a dog that drops into and engages with the teeth of the rack. One man pushes the carriage ahead one notch at a time and draws it back until the dog is solid against the tooth of the rack at each stroke of the punch. Another man stands ready to stop the punch should the first man fail to get the carriage in adjustment before the punch descends on the next stroke. In this way a sheet can be punched as rapidly as the punch will work, and each hole will be properly spaced and in alignment. For changing the pitch of the rivets it is only necessary to change the rack beneath and each sheet is adjusted for a line of holes as soon as it is clamped in position for the first hole. There is no necessity for a large gang of men being kept busy at the punch; two can do the work in about one-third the time consumed in the ordinary way with a gang of four or five. Of course it is essential that the wheels and rails shall be true, that the dog and rack shall be carefully machined; but other than this the apparatus requires no special care in its manufacture.

Electrical Progress.

Highest Efficiency of Galvanic Batteries.

Henry Morton, Ph.D., has a practical article in *Cassier's Magazine* for June, on the maximum possible efficiency of galvanic batteries. He refers only to that class of galvanic batteries shown by experience to be the most efficient in supplying large currents, and says:

In all the batteries here referred to, there are the following common features: 1st, The energy is derived from the combination of zinc with dilute sulphuric acid; 2d, The supply of oxygen required for this combination is obtained by the decomposition of water or some other compound in aqueous solution.

The source of energy being the reaction between the metallic zinc and the dilute acid, its amount can be expressed in British thermal units as follows: Oxidation of zinc, 2340 B. T. U.; solution of oxide in dilute sulphuric acid, 666 B. T. U.; or, in all, 3006 B. T. U. as the total energy developed by the union of the zinc and acid. No arrangement of parts or employment of one material or another in other parts of the cell or for other parts of the reaction can add anything to this, but on the other hand there must always be more or less subtracted from it to meet the demands of the reaction, to say nothing of internal resistance of the solutions, local action, etc. In order that the zinc should combine with the acid, the hydrogen, whose place it takes, must be driven out or otherwise taken care of, and this will demand an expenditure of energy, greater or less, but always considerable. For example, in the Smee battery the oxygen is simply driven out in bubbles of gas. To do this requires 2106 B. T. U. for each pound of zinc dissolved. Taking this from 3006, leaves only 900 B. T. U. as even possibly available from each pound of zinc consumed in a Smee battery, not counting losses coming from local action, resistance, etc.

This difficulty was realized at an early period and was met by supplying oxygen to take up the hydrogen, and so avoid the great loss involved in expelling it. To supply this oxygen, various substances have been used, but the only ones of practical importance are sulphate of copper, nitric acid and chromic acid. But even with these, more or less energy must be expended in decomposing them and securing their oxygen.

Such a rate of consuming zinc as a pound a minute would, of course, require an immense galvanic battery, and indeed it is usual to express the consumption of fuels generally in pounds per hour. To get the horse power due to the consumption of zinc at the rate of a pound an hour, he gives some figures which indicate the horse power developed by a pound of zinc consumed during an hour as follows:

Smee battery	0.35, or about	⅓ H. P.
Daniell battery	0.55, "	½ "
Grove battery	1.06, "	1 "
Poggendorff battery	1.14, "	1 17 "

Showing that in the best forms of battery an allowance of one-horse power for each pound of zinc consumed per hour would be a liberal one, if something is allowed, as it must be, for the resistance, local action, etc. He concludes by saying: It may, however, be asked: If such an improvement has been made as above shown from the Smee battery give ⅓ to the Poggendorff yielding 1⅓-horse power, may we not expect further improvements as great in amount? To this I answer certainly not in this class of batteries. The entire energy of the reaction between the zinc and dilute acid is 3006 British thermal units. This would represent 2,320,632 foot-pounds or 70.62-horse power for one minute, or 1.17, say 1¼, horse power for one hour, and this would be an absolute maximum which could never be reached, far less exceeded.

Of course, if we could use some other, and more efficient, reaction than that between zinc and sulphuric acid, some gain might be secured, but nothing of that sort has ever been accomplished, nor from what is known of the combining or thermal equivalents of the available elements, is much to be expected in that line. At all events, we may well accept this as a certain fact, that in any known form of galvanic battery the round figure of a pound of zinc per horse power per hour is an outside figure for efficiency, and when anyone asserts that more than this has been secured, there is certainly some mistake or fraud.

Waste in Electric Stations.

Every electric light or power station, whether large or small, is provided with a steam plant which contains a number of engines and a number of boilers. To make the plant flexible, and adapt it to the variable load, a multiplicity of units seems a necessity. The steam plant, or a portion of it, is in operation, as a rule, night and day during the whole twenty-four hours, and two or more gangs of attendants are employed to care for it. There are boilers enough under fire and steam to supply the plant when called upon for its maximum output, and a sufficient number of engines are kept warmed and ready for duty to meet the ordinary requirements of the service and any unforeseen emergency caused by change of weather or extra demand. One of the rules of electric-light operation is that the power must be "on tap," as it were, whenever it may be called for, and every attendant is imbued with the importance of this idea. Under these circumstances, how does the man who shovels the coal and handles the dampers of the boilers, or the man who starts and stops the engines and controls the valves of the station, perform his duties? If these men follow the natural bent of workmen in their positions, the result will be this: A greater number of boilers are maintained with live fires than are needed for the moment, and those not required for immediate use are thrown out of active service by opening the fire-doors and closing the ash-pit doors, leaving dampers open and coal on the grates in the active condition of burning. Dependence is here placed on the cooling produced by the inrush of cold air to the furnaces and deadening of the effect of the fires to prevent too great generation of steam. This practice certainly checks the generation of steam, but it does not stop the consumption of coal. That goes on, though at a reduced rate, the resulting heat being carried off with the air to the chimney. In the same line, the boilers which have banked fires are left with draft on and doors wide open, thereby causing a more rapid combustion of the bed of coal in the bank than would otherwise occur, and, what is worse, cooling down the boiler and its contents through the introduction of the cold air. The loss of heat thus caused must be made good by burning new coal when the boiler is again set to work. There is no need of thermal storage tanks to prevent the waste caused by these practices. Proper oversight of the firemen and the right sort of instruction on these points is sufficient.

The engineman has a different class of duties. His great object is to have the engines ready in time and keep them in reliable operation. One important foe he has to fight is water in the steam. He must keep the pipes well drained, run the engine long enough when first starting without load to insure free pipes and free cylinder; and there is no guide save judgment to show him when this condition is realized. The result is that engines are run a longer time underloaded than the legitimate light load of the station represents, and generally longer than needed for the purpose in view. During the preliminary running drips of steam pipes and cylinders are, as a further precaution, kept wide open, which adds much to the wastefulness of the practice. Furthermore, when the engine is out of use, the drips are left open to a greater or less extent so as to keep the pipes drained, and too often the drains of the engine pipes, and of the main system of piping of the boilers as well, are without adequate trap protection. The matter of how the drips are handled is one which is often lost sight of in many kinds of steam plants beside the electric, but it is important everywhere, and it provides an avenue of waste which is frequently serious. In the electric plant it is peculiarly liable to be important, owing to the exigencies of the service. The loss from careless handling of drips bears a much larger proportion to the legitimate output when the load is small, as much of the time occurs in electric work, and for this reason waste in electric plants is liable to be extravagant where the matter is neglected. It should not be understood from these statements that the thorough drainage of water from the pipes and cylinders is uncalled for. It is in reality one of the most important matters in the care of engines. With the unthinking enginemen, however, it may be abused, and it is the abuse of the practice which is the cause of much of the waste in electric stations.

D. McFARLAN MOORE, an electrician of Harrison, N. J., one of these days expects to sell sticks of light the size of a stick of candy, that will outshine rays of sunlight and remain illumined for forty-eight hours without replenishing their burning qualities. These light sticks, he intends, shall completely revolutionize the science of illumination, and are to be carried in the waistcoat pocket and connected with a button, which it will be only necessary to press to secure a bright light. Mr. Moore declares that his invention is in accordance with a new principle in molecular vibration. It required much study to discover it, and could not be improved by even the secret process of the firefly. Mr. Moore proposes to emulate the glowworm, however, and, instead of having the present filament in the ordinary incandescent light, he will make the entire surface of the glass glow with brilliant light, and without any heat whatsoever. He further alleges that he is able to separate the several divisions of energy and employ only the illuminating elements. He employs the ordinary current of 110 volts, and from this he gets a light that compares very favorably with sunshine.

M. RENAULT has recently devised a neatly arranged dry battery. Each cell consists of a carbon vessel, in the bottom of which is placed chromic acid mixed up with gelatinous silica, this latter possessing the remarkable property of absorbing sixty times its volume of water. On the top of this jelly a disc of porous earthenware is laid, which supports a zinc spiral immersed in a second layer of gelatinous silica, this time without the addition of the chromic acid. The cell is claimed to be very compact for its power.

WORKMEN are engaged in Corvallis, Or., in placing the 100-horse power boiler in position at the electric light works.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from John B. Rathburn et al in the Lost Camp mine, near Blue Canyon, Placer county, to impound tailings behind brush dam in Wood's Ravine; and from A. J. Mason, in the McFadden mine, near Mokelumne Hill, Calaveras Co., to impound tailings behind rock and brush dam in Buckeye gulch, gives notice that a meeting will be held at Room 92, Flood building, San Francisco, Cal., June 17th, 1895, at 1:30 P. M.

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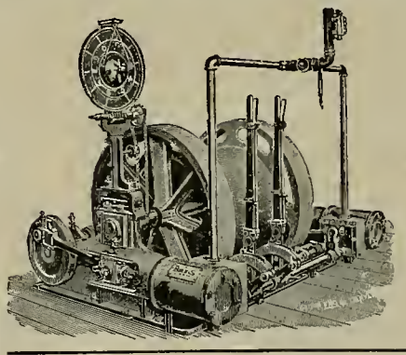

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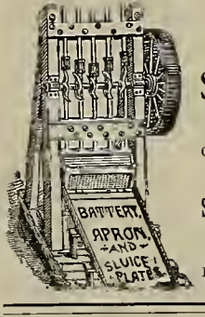

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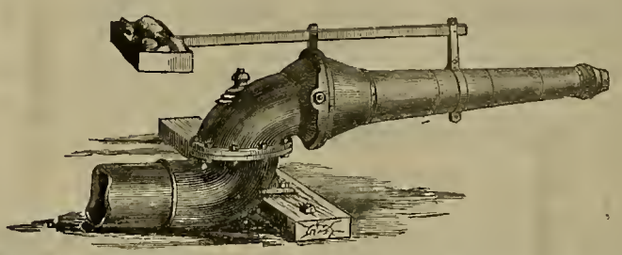

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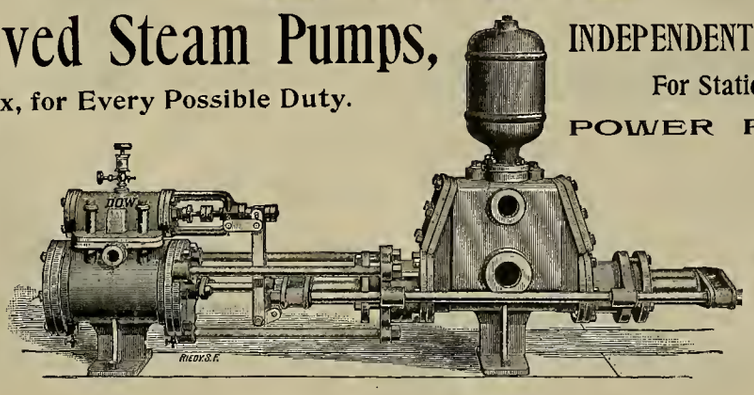

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GENERAL NOTES.—*Republican:* A. Hayward has commenced work on the Hazard quartz mine.

The miners who recently quit work on the Mayflower and other claims on account of their wages being in arrears, have heen paid six per cent of the amounts due them last Saturday.

D. Gutman has an option on the Massa quartz mine, for $10,000.

Calaveras.

GENERAL ITEMS.—*Herald:* J. Waltman has shut down his mine on account of the exhaustion of the water supply. He is in this city to get an engine, and, with steam for power, will resume.

Three to five dollars a day are heing taken out of the Moyle mine at Wade's flat. So far they are straight down 100 feet and 50 feet on an incline.

Colonel Shaughnessy, who closed down tbe Baumhogger mine a few days ago, will arrange for the erection of a sinking plant for that property.

L. Waggoner is looking over the Carley property at Altaville with a view to putting up a chlorination works there. He claims to be able, with this process, to make a saving of $4 per ton.

Del Norte.

CINNABAR.—Crescent City *Record:* The recently discovered cinnahar mines on Diamond creek, a short distance heyond the North Fork of Smith river, on the old Wimer wagon road, is attracting considerahle attention among the citizens of this place.

Kern.

AMALIE MINING DISTRICT.—[Special Cor.]—The Picnic Mining Company are haviug a milling test made, for which purpose they have hauled twelve tons of ore to the Amalie Company's mill. The result will be known in a few days. This mine was discovered about two months ago and from numerous assays taken the ore will run about $100 per ton.

The Amalie Mining Company have put on a night shift. They are now down a little over 200 feet, and have put in a new gasoline hoist. With a day and a night shift they expect to do some very rapid sinking during the next few months. This company struck a new eighteen-inch shoot of shipping ore the other day, the richest ever taken from this remarkable mine.

Messrs. R. E. and Henry J. Dull have discovered and located a mining claim, which they call the Mayflower. It is situated about one-half mile northwest of the Amalie and from it has been taken some very good ore. This is another result of careful, faithful prospecting. G. E. F.

Mariposa.

GENERAL NOTES.—*Gazette:* The Branson five-stamp mill, on Cotton creek, was not completed until May 8th, and only a few days' run was made, owing to a lack of water for power. The parties interested have two mines, in which the ore runs from $6 to $14 per ton. They will take out considerable rock this summer and will run the mill steadily during the coming winter, unless they should conclude to put in steam power.

At the Santa Rosa mine grading has heen done for the mill site. Men are taking out rock and getting ready to put the property on a producing hasis.

Nevada.

THE EAGLE BIRD.—At Eagle Bird mine thirty men are employed. The ledge shows gold and galena sulphurets. The thirty stamps work continuously.

THE CALIFORNIA MINE.—The *Telegraph* is informed that the California mine has begun work, and that the Evening Star (Seven-Thirty) mine shows rich ore. It is expected that the crushing will be done at the California mill, which is near by.

GENERAL NOTES.—*Tidings:* The Harmony mine distributed over $3000 on its pay day, last Tuesday.

The Bellefontaine is producing some extremely rich ore. A quantity taken from the 600-foot level is good for $200 or more per ton.

Herald: Twenty-five extra stamps are to be put up at the Mayflower mine. Twenty of them will he brought over from Forbestown, a contract having been let for the hauling over of two ten-stamp mills from that place. It is evident that the Mayflower is looking well.

Plumas.

MINING NOTES.—At the Thistle Shaft, gravel drift mine, 140 men are employed.

Thirty men are employed at the Slate Creek tailing claim, La Porte. The tailings are raised hy hydraulic elevator, which carries a steady stream of water, tailings and gold from the bedrock into the gold flume, situated on the hank of Slate Creek, some twenty feet or more perpendicularly above its hed. The usual difficulties attendant upon the employment of new appliances and methods were met hy this company in getting their elevator to bedrock last season. These have heen overcome and it may he expected that a highly remunerative run will he made this year as the elevator works well, carrying the grit up hill to the flume as fast as it can he brought to it.

At the American, Washington Hill, Charles Walters of Gihsonville has a number of men at work getting out timber fcr a dump house. The channel in this property was recently tapped at a point sufficiently low for stripping an extensive area of bedrock.

Mr. Stevens is preparing to put in restraining works at Sawpit.

The Donalsdon quartz ledge, on Onion Valley creek, will be thoroughly prospected this season, by Mr. Sumner, who has employed four men for that purpose.

GENERAL NOTES.—*National-Bulletin:* John Lawrence has hought the H. C. Leighty mine near Granite Basin, and has hegun development work.

At the Christie mine Superintendent Dillon has fifteen men employed.

Mr. Benjamin of Oakland, has purchased the Cooper & Sullivan quartz mine, and has let a contract to run a tunnel for development purposes.

The old "Mexican" quartz mine has been honded hy a San Francisco company represented hy J. A. Hall, who is preparing to begin operations immediately.

Riverside.

GENERAL NOTES.—*Record:* Dr. J. W. Reese has let a contract to sink on the Kimherly mine, on the east side of the valley.

J. D. Moulton, at his Hillside mine in the Rice district, has men at work running a tunnel.

Connection is expected to he made the coming week hetween the shaft and the 700-foot tunnel in the Santa Fe mine. When this is done the company will begin taking out ore and start up the mill.

The shaft in the Golden Chariot mine is now down 215 feet and it will he sunk 150 feet farther, when drifting will he pursued. Drifts forty feet deep have heen run at the 215-foot station and good ore has heen encountered. A steam hoist will he put in operation.

At the Santa Rosa thirty-three men are employed. The directors are considering the advisahility of sinking the main shaft to a depth of 1000 feet. If this be done it will make the Santa Rosa the deepest gold mine in southern California. The shaft is now down 300 feet. The mill is turning out bullion to the amount of $10,000 a month.

Conditions at the Good Hope have not changed. Mill and mine are hoth shut down, and it is prohahle they will remain so for some time to come.

San Bernardino.

CLAIMS SOLD.—J. V. Brighton, who located several claims in the Morengo district, north of Indio, last March, has lately sold them to Butte county men for $15,000, who intend to put in a mill, and claim to have enough ore in sight to cover the price they paid for tbe mines.

DROP INCREASED.—The drop of stamps in the Vanderbilt Bronze mill has heen increased to ninety drops per minute. Smelting ore is heing taken out of the 150-foot level of the Gold Bronze mine.

Shasta.

GENERAL NOTES —W. R. Conant has struck a six inch vein on Portuguese flat.

L. Wolleh of this city has leased the Hope mine near the Tower House with the privilege of huying and has men at work running a tunnel.

Mr. Hascall who recently honded several properties in Mule Mountain District, will soon put a force of men to work developing same.

Charles Toser is at Old Diggings, to examine the Reid group of mines, for Hayward & Lane.

E. C. Brown, the mining engineer, is at Dog Creek, examining mines for an English syndicate.

LOOKS AS THOUGH PAINTED WITH GOLD.—*Fress Press:* The owners of the Eureka Tellurium Gold mine, at Middle Creek, who last week discovered a rich hody of ore at the bottom of their shaft have this week discovered a still richer hody of ore. The face of the ledge has the appearance of having heen painted with a brush dipped in gold.

THE GLADSTONE.—The Gladstone, at French gulch, has made another clean-up of hullion $21 fine. Mr. Brightman is considering the matter of burning crude oil in his engine, as wood is getting scarce, causing an expense of about $20 per day.

Tuolumne.

GENERAL NOTES.—*Independent:* The Mooney mine, which adjoins the Trio on the south, will shortly begin work. Rich ore was formerly taken out of this mine.

Development goes on in the Oliver & Harris mine. The ledge is eight feet wide and gives an assay of $7 per ton.

At the Rappahannock the shaft is 300 feet deep. No crosscutting will he done till the mine has attained further depth. The sinking is very good. The ore hody now heing pierced is of low grade, but on the hanging wall, and to the east, is the east vein, where a rich shoot is known to exist, as demonstrated hy the old south shaft, from which formerly rich ore was extracted, but heing too near the surface the owner has decided to sink the new shaft, to the north, a considerable depth before tapping the shoot.

At the Dead Horse the quartz is well sprinkled with free gold, carrying three per cent of arsenical sulphurets and ahout one per cent of galena. This find is at the 1300 foot level, north of shaft. Principally all the work of development is confined to this end of the mine. The ore from this shoot is being milled. The Superintendent is making preparations to sink helow the 1400 foot station. Drifts will be run north to intersect the ore hody now found at the 1300, as ahove described. The general average of the rock pays about $8 in free gold, in mill.

Work has begun on the Soulsbyville which is being reopened from an air-shaft to the south.

The Black Oak mine made a rich strike this week at the 600-foot level. The owners are ahout erecting a reverberatory furnace to calcine their ore; latterly, they have, in a crude way, been making outside kilns, and burning the ore, which has proved a success, which suggests a more complete method of calcining. This system liberates the gold from its base embrace, thereby permitting it to be amalgamated.

The Louisiana mine at Cherokee, west of the Eureka vein, in early days, produced rich free gold, hut in depth, most of the free gold passed into the base metals. Messrs. Hall & Howe are unwatering the shaft, 300 feet deep.

NEVADA.

WASHOE CO.

COL. LOW'S REPORT.—Col. J. B. Low has made a report on the Brunswick lode, in which he says in part: The Brunswick lode is located in Storey county, Nevada, ahout 7000 feet east of and parallel with the Comstock, which is a twin vein formed at the same time and with many of the characteristics. At the northern or Monte Cristo development we find a great outcrop of quartz with strata of pay ore from three to twelve feet in width. Much of the ore has heen mined out perhaps to a depth of 100 feet and has paid from $10 to $20 per ton, 50% of which was gold. This work was done by parties under lease, and in a temporary manner. A heavy flow of water caused a suspension, hut not until something like $500,000 had been extracted. The prospect is of great merit, and now that the Sutro tunnel has thoroughly drained the fissure of water, mining should he commenced in good form. Passing south from the Monte Cristo we find a few test pits showing the continuance of the quartz croppings, and traces of gold and silver; hut the first development shown is in the prominent outcrop on a point making down the hill on the Bailey claim. Here tunnels have heen run at slight depths, and ore of paying grade extracted, also a large irregular opening has heen mined from the surface. I learned that some $50,000 or $60,000 had been mined here mostly hy gambocinos and trihuters.

The fissure maintains its width for perhaps 100 feet, with its porphyry walls. A strong upheaval or dyke of andesite also appears on the surface slightly to the east of the vein. At the St. John's mine, which lies directly over and crosses the Sutro tunnel, which cuts the vein at right angles 1350 feet below, many thousands of tons of ore have heen quarried from the croppings of the veins and mined from a tunnel which cuts the vein at slight depth. The vein is fully 100 feet in width, and has been opened by surface excavations and lateral drifts from tunnels ahout 200 feet on the vein.

Thousands of tons of ore that will pay a profit mostly in free gold can be mined from the surface. Passing on to the south, we find hold outcrops of the great wide vein on the North Occidental, giving promise of ore when intelligently prospected. A little farther south we encounter the old surface workings of the Occidental proper. With all this I have been familiar for many years, in fact at one time during the good days of the past (when I was at the mine) several good mills were kept running on ore from this part of the Occidental mine.

During that period a tunnel was run at some depth helow, and the vein mined successfully. Later a deeper tunnel was run, tapping the vein ahout 550 feet vertical, helow the old upper workings, and leading out and on a level with tbe Occidental mill. Through this tunnel I entered and inspected all the points of interest in that part of the mine, the most important of which is a vein of good ore which has lately heen encountered in a west crosscut on the 550-foot level. A winze has been sunk on this ore some 40 feet, and the pay vein continues and is now about four feet wide in the hottom, and carries about $40 in gold and silver, is well sulphuretted quartz, quite free from lime. The appended certificate of assay hy Prof. Price is from a large sample of the hest ore. A drift or crosscut also cuts this vein of ore. There is plenty of evidence in sight to warrant me in recommending a more vigorous prosecution of the exploration of the great mass of quartz and spar between the east and west walls, which are fully 200 feet apart in this part of the fissure. The property is in good order, with a first-class mill conveniently located, also excellent buildings, etc., for accommodating workmen. The rock is exceedingly hard. One wonders why so fruitful a vein should he allowed to drag along for years without air drills and other improvements of the age. A single-handed hammer pounding a drill-head in such a vast field of vein matter is bad economy. Mr. Kinkead, the present superintendent, has shown much ability in every department. Having passed judgment to the best of my ahility on the surface—upper works—I was taken to a point where the Sutro tunnel crosscuts the Brunswick vein and exposes a body of quartz more than 120 feet in width carrying traces of ore.

A drift has been run here in the Brunswick vein southerly, known as the Zadig drift, possibly 1000 feet. I was unahle to reach the face, a cave having broken the air pipe and cut off ventilation. So far as inspected, only occasional suspicions of ore are visihle; this is also very much the case at the same depth (1344 feet) in the Comstock lode, and had we cut that vein on the same level before developing the ore above I fear we might have missed several hundred millions of dollars worth of ore.

In conclusion, the Brunswick lode is within a mineral zone. It is a very strong vein of good matrix and carries both gold and silver for the entire length from the Monte Cristo on the north to the Occidental on the south. In every place where the vein has been worked to any extent pay ore has heen obtained. At all times when work was attempted heretofore too much water was encountered to render it practicahle to mine ore of low grade. The exceptional richness of the ore found in the Comstock vein attracted capital away from other promising prospects in that vicinity. The entire Brunswick vein, and all veins encountered, are now freed from water by the Sutro tunnel, thus enabling owners to work the mines for about 50 per cent of the former cost.

Samples from the Occidental winze, on the 500-foot level, prove conclusively that rich ore exists at that point in paying quantities, and samples brought with me from every other point mentioned fully justifies all the foregoing conclusions.

OREGON.

JOSEPHINE COUNTY.

COPPER DEPOSITS.—Large copper deposits are said to exist in Josephine county, thirty miles south of Grants Pass, at the mouth of Falls creek on the west bank of the Illinois river.

A. M. Brown has bonded eighteen claims on the creek and brought Geo. F. Wbecler from Baltimore, who hought an interest in the claims, and on returning to Baltimore organized the Siskiyou Mining Co. and sent out the necessary capital for Mr. Brown to commence development work with and to put in the necessary machinery for a test.

They are now opening the mine in two places, hy tunneling, and getting out ore which is said to run from twenty-two to forty-five per cent pure copper.

At present twenty-two men are at work.

JACKSON COUNTY.

TO BE SOLD.—Sheriff Patterson will sell the Ashland mine July 6th to satisfy judgments against the property by Kinney & Provost, $9988.60, with $1200 costs; T. K. Bolton, $2305.30 and $5500, with $570 costs and attorney fees; a total of approximately $20,000 judgments. Four claims are embraced—the Nutshell mining claim, the A. N. King mining claim, the Patton extension of the A. N. King and the Rogers & Roach claim.

WASHINGTON.

AT LOOMIS.—The Rush Mining, Milling and Smelting Company has heen absorhed by the Chapacca Mining and Milling Company; on June 1st they shut down all their workings to arrange their affairs, consequent on the death of the president of the company.

BRITISH COLUMBIA.

AROUND NELSON.—Nelson *Miner:* At the Poorman the ten stamps are putting through only about ten tons a day just now as a certain amount of dead work has to be done. At Forty-nine creek, "Our Company" has got the hedrock flume laid nearly to the point at which it will cover enough ground to save the handling of the houlders which takes so much time at present.

A feeling of confidence in the return of good times is making itself felt, especially hy the owners of gold claims on Toad mountain and the adjoining hills.

MONTANA.

MONTANA'S MINE SIGNAL CODE.—State Mine Inspector Shoemaker and Deputy Inspector Miles have compiled a code of mine signals, which takes effect June 15th. The full code is as follows:

SIGNAL BELLS.

1 Bell hoist, 1 Bell stop (if in motion).

2 Bells lower men, 3 Bells hoist men.

4 Bells hlasting signal, engineer must answer hy raising bucket or cage a few feet and letting it hack slowly. Then 1 Bell hoist men away from hlast.

5 Bells steam on, 6 Bells steam off.

7 Bells air on, 8 Bells air off. 3-2-2 send down drills, 3-2-3 seud down picks.

9 Bells danger signal (case of fire or other danger), then ring number of station where danger exists. No person shall ring any signal hell except station tender, except in case of danger or when the shaft is heing sunk. Engineers must slow up when passing stations when men are on the cage.

STATION BELLS.

2 Bells, Pause, 1 Bell	Station No 1
2 Bells, Pause, 2 Bells	Station No. 2
2 Bells, Pause, 3 Bells	Station No. 3
2 Bells, Pause, 4 Bells	Station No. 4
2 Bells, Pause, 5 Bells	Station No. 5
3 Bells, Pause, 1 Bell	Station No. 6
3 Bells, Pause, 2 Bells	Station No. 7
3 Bells, Pause, 3 Bells	Station No. 8
3 Bells, Pause, 4 Bells	Station No. 9
3 Bells, Pause, 5 Bells	Station No. 10
4 Bells, Pause, 1 Bell	Station No. 11
4 Bells, Pause, 2 Bells	Station No. 12
4 Bells, Pause, 3 Bells	Station No. 13
4 Bells, Pause, 4 Bells	Station No. 14
4 Bells, Pause, 5 Bells	Station No. 15
5 Bells, Pause, 1 Bell	Station No. 16
5 Bells, Pause, 2 Bells	Station No. 17
5 Bells, Pause, 3 Bells	Station No. 18
5 Bells, Pause, 4 Bells	Station No. 19
5 Bells, Pause, 5 Bells	Station No. 20
6 Bells, Pause, 1 Bell	Station No. 21
6 Bells, Pause, 2 Bells	Station No. 22
6 Bells, Pause, 3 Bells	Station No. 23
6 Bells, Pause, 4 Bells	Station No. 24
6 Bells, Pause, 5 Bells	Station No. 25
7 Bells, Pause, 1 Bell	Station No. 26
7 Bells, Pause, 2 Bells	Station No. 27
7 Bells, Pause, 3 Bells	Station No. 28
7 Bells, Pause, 4 Bells	Station No. 29
7 Bells, Pause, 5 Bells	Station No. 30

ELECTRIC BELLS.

Where electric bells are used in connection with other bells, use the following signals:

If cage is wanted, ring station signal. Station tender will answer 1 Bell.

Reply, 1 Bell to go up; 2 Bells to go down.

If station is full of ore and station tender is wanted, ring station signal and do not answer hack.

If 2-1-2 Bells are rung, engineer or station tender does not understand; repeat signal.

In case of danger or accident, ring station signal; station tender will reply 3-2-1, ring 9 Bells.

One copy of this notice should he posted on the gallows frame, and one before the engineer.

C. S. SHOEMAKER, State
JOHN MILES, Deputy. Mine Inspector.

QUARTZ VS. PLACER.—The commissioner of the general land office at Washington has made an important ruling in a quartz vs. placer suit which was tried in the Montana courts one year ago, resulting then in a judgment for the lode claimants.

Some time in 1881, John Noyes and others obtained a patent to a placer claim in this county. Peter Ross and others filed on it as the Bonanza lode. The Helena land office rejected the application because the location was entirely within the patented placer. An appeal was taken to the general land office,

and the commissioner in his decision says the refusnl of the Helena office to file the application was in accord with the practice of the department, hut cites a recent decision in the case of the South Star, in which the former departmental decision was overruled. The commissioner says:

"A placer patent does not operate to convey any lode or vein situated on the ground entered, which was known to exist at date of the placer application, because, by the express terms of the placer patent, all such known lodes or veins are excepted from the grant. As no title to a known vein can be passed by a placer patent, the fee simple to such known lodes continues to reside in the United States until it parts with the same in accordance with law, and consequently the United States continues to have jurisdiction over all such known lodes or veins, and therefore this department may entertain and consider applications for patent therefor, notwithstanding the outstanding placer patent.

"From said decision in the South Star case I quote: 'And it is now held that, when it has been ascertained by inquiry instituted by the department, or determined by a court of competent jurisdiction, that a lode claim existed within the boundaries of the land covered by a placer patent, and that such lode claim was known to exist at the date of the application for such patent, and was not applied for, the land embraced in said lode is reserved from the operation of the conveyance by the terms thereof, and patent may issue for such lode if the law has been in other respects fully complied with.'

"The important, material and controlling question in such cases appears to be: Is there within the limits of the patented placer a lode or vein which was known to exist at date when the placer application was filed? In the case at bar, this question is conclusively answered by the finding of the district court.

"It is therefore held and decided that, at the date when the placer application was filed, the property known as the Bonanza lode was a known vein or lode; and that, because of this fact, the title thereto still vests in the United States, subject to disposition under the provisions of the law relating to lode mining claims.

"For the reason that since your decision was rendered the department practice in such cases has been modified, your decision is hereby reversed, and the record returned, and you are directed to file and consider contestants' mineral application."

UTAH.

THE IBEX.—*Tribune:* The deal by which the Ibex Mining Company acquired temporary possession of the Ibex mine, in Detroit district, is off, and on Monday next work will be resumed by S. F. Mount and his associates, to whom the property has reverted.

Few deals in mining have undergone more vicissitudes than that from which the Ibex has just issued. The company having procured the option upon it for $135,000, the development of its resources was begun, and since taking possession some 500 feet of work has been performed, and about 3000 tons of ore marketed, that showed a valuation of $40 gold, and from three to ten ounces silver and seven per cent copper. Of the purchase price $45,000 has been paid, and this, by a series of defaults, beginning on January 1st, when $20,000 only of the $36,000 payment that was due was paid, is all forfeited with the mine.

COLORADO.

CRIPPLE CREEK.—*Mining Industry:* In a little region of country covering not to exceed twenty square miles there are nine towns, and every gulch has its cabins and houses, and every hill its shaft houses and prospect holes by the thousand. The population is estimated at 20,000—the number of producing mines at ninety or more. No one knows how many value-produeers there are, and no one can anything more than roughly estimate the holes which are being dug. They number into the hundreds. In some places the hills are covered with men.

Probably no other camp in the world possesses the physical features shown at Cripple Creek. The hills are rounded, grass-covered, timbered only in a few spots, and covered with debris or slide varying in depth from five feet upward. The veins, except occasionally in granite, do not crop to the surface, so that the prospecting is all "blind." Men take leases in grass plots, where there is no evidence of veins or ore, and dig holes hit and miss, or dig trenches, hunting for veins. Generally they succeed in finding some, because veins are very thick there, and they run in every direction. These veins are generally small—perhaps contraction fractures formed when the melted rhyolite cooled. Some, however, are strong and long, permanent veins. These veins appear to have some close relation to dykes, formed after the overflow of rhyolite, and are often contacts between the dykes and enclosing rocks. The deepest workings in camp are about 600 feet below the surface, and the stronger veins show no evidence of exhanstion. What change there may be in the ore when the true veins pass from the overflow of rhyolite into the underlying granite no one can tell. There is reason to believe that it may not be for the worse. It is known now that the veins outcropping in the granite carry very rich ore. An evidence is seen in several, most notably in the Independence, which probably carries the largest body of high-grade tellurium ore ever found.

Most of the ore is not at all adapted to the stamp mill or amalgamation process. It is doubtful whether the stamp mills which have been running there have saved on an average more than twenty-five per cent of the values, with one exception, which sizes and treats its tailings by a method of concentration well adapted to them. That method is to run them, after sizing, through a 45-mesh screen, over a stationary, wide inclined table covered with canvas. These tables are washed with a hose every few minutes, the concentrates they have gathered being collected in a trough.

The cyanide and chlorination methods are both used successfully. They buy ore which carries less than five ounces gold per ton, paying $19 an ounce for the gold and charging $8 per ton treatment, and they are running full and constantly, treating on an average approximately 200 tons daily. This includes the purchases of the mill at Florence.

ARIZONA.

ORO BLANCO DISTRICT.—*Citizen:* Warsaw camp has been abandoned, and silver mines are no more sought. Around the old camp new gold properties are being opened. A good gold porphyry lead was recently found right in the excavations of the mill. The outlook for the district was never better. The Old Glory mill will enlarge its plant to fifty stamps. The Montana and the Yellow Jacket are in full blast. The Austerlitz mill will soon be humming again, with redoubled vigor. The Orn and Julia mill foundation is being built and the Tres Amigos and McDonald group people each declare they are going to have mills shortly. Prospects are also good for a mill on the Boston and St. Patrick properties.

ALMOST INCREDIBLE.—*Our Mineral Wealth:* The Temple gravel beds, on the Colorado, report a cleanup from bedrock of $33.75 in gold to the yard of gravel.

LOWER CALIFORNIA.

Speaking of the receipts of gold dust and bullion from Lower California, the San Diego *Union* says: "There is $40 in gold brought to this city from Lower California to $1 received from mines in this county. Some of the richest specimens ever seen by old miners have lately come from the peninsula, where rich strikes are continually being made, and the predictions made some years ago regarding the enormous mineral wealth of Lower California appear to have better foundation than ever. Gen. Humphrey and H. E. Wood, who some time ago started to reopen the old San Fernando copper mine below San Quintin, are about to establish a smelter of about fifty tons capacity at some central point, probably at San Vicente, between Ensenada and San Quintin, and convenient to Socorro and Valladares.

MEXICO.

THE EL PIOMO.—The Nogales *Oasis* says the El Piomo Mining Company, whose extensive properties are located in the Altar district, about sixty miles from Santa Ana, Mex., contemplate ore reduction on an extensive scale. During the past two years operations have been confined to development work, and there are now 50,000 tons opened for extraction. The ores are carbonates of iron and lead carrying gold and silver. It stated that 18,000 tons of ore from this property, smelted at Nogales, yielded an average of $20 per ton gold, 12 ounces in silver and 22 per cent lead.

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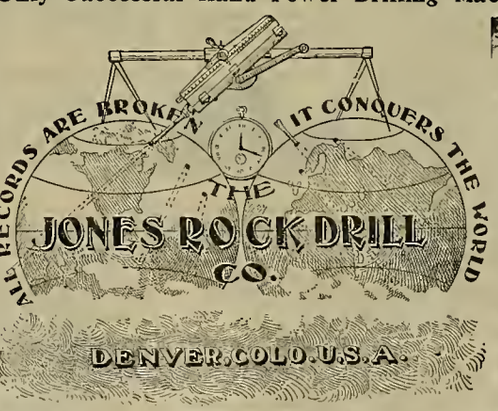

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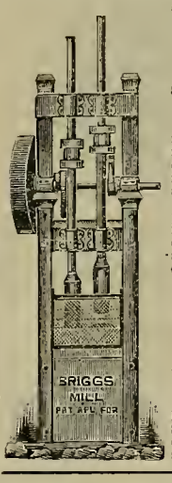

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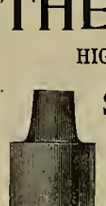

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Railway Construction in the Peruvian Andes.

There are no public roads in Peru on which vehicles can be used except in the vicinity of Lima, the old roads made by the Incas all over the part of South America which tbey controlled being only for foot passengers and llamas, says J. R. Maxwell in a recent paper. They were generally well arranged for grade, but the location was bad. The Spaniards made little improvement in roads, although they built some good stone bridges over the larger streams. There is a good wagon-road from Lima to Callao, and these were all the ways of communicating with the interior until about tbe middle of this century, when the first railroad was built. It extended from Callao to Lima, about 7½ miles, was used for passengers only, and was very profitable. The work on it was ligbt, and the total cost not over $150,000. Another road was built from Lima, about eight miles long, to Chorillos—a summer resort on the Pacific ocean.

Late in the sixties tbe Peruvians saw how the Chilians were opening up tbeir country with railroads, and became anxious to develop their own in tbe same manner. The Government had a large revenue from the sale of guano, of whicb it had a monopoly, and easily floated a loan in England and organized a system of public works. A number of roads were projected, several of which were to cross the Audes; but the great number were only local, reaching in from tbe coast to some productive locality. A survey made to ascertain the expense of extending the railroad from Mollendo to Islay, only six miles along the coast, showed that it would cost $1,500,000.

Tbe board of public works, composed of engineers, some educated in this country, but most of whom had studied in Europe, fixed tbe standards for maximum rates of grade, minimum radii of curves, minimum lengtb of tangents between tbe curves in opposite directions and the rate of compensation on curves, with some of the details of construction. The maximum grade was fixed at 4%. On curves of 120 meters radius the grade was fixed at 3%, wbile witb 600 meters radius no compensation was required, and between these limits the rate was made proportional. The minimum length of tangents on curves turning in opposite directions was made 30 meters. The standard road-bed was 14 feet wide; cuts, 16 feet at sub-grade; tbrough bridges, not less than 14 feet in the clear; tunnels, 15.75 feet at the springing line of the arcb aud 18 feet higb inside; minimum thickness of masonry lining, 16 inches. Tbe gauge of most of the roads was 4 feet 8½ inches, but tbere was oue road of a meter gauge and a small one of 3 feet 6 inches. The contracts for most of these roads were let in 1869.

Mr. Maxwell describes in detail the construction of the roads from Chimbote up the valley of the Rio Santa, 165 miles to Recuay, and the Southern system—the largest in Peru—consisting of tbe road from Mollendo, 107 miles, to Arequipa; from there, 218 miles, to Puna, and auother, from Juliaca, 210 miles, to Cuzco, of whicb only 112 miles are finished. The road from Juliaca runs nearly due north and crosses the summit of the eastern range at an elevation of 14,200 feet. When finished, the lowest elevation on the Cuzco branch will be 10,500 feet above tide-water.

Tbe most celebrated of the roads is the Ferro Carril Central del Peru. Starting at the docks in Callao, it keeps rising until, at 106 miles from the coast, it reaches a height of 15,666 feet (about that of Mount Blanc). It tben descends, and in thirty miles falls 3489 feet. When completed 264 miles farther, it will reacb the navigable waters of the Amazon, and this extension will probably not cost more than half as much as the finished portion. There are eight switchbacks on tbis road, four of them being double. There are fifty-seven tunnels in a distance of twenty-four miles, mostly through rock spurs. Work was begun on tbis road in 1870, the track being laid to Chicla in 1875. It was resumed in 1890, and track was laid into Oroya on June 10, 1893. All of this work was done at an altitude above 12,000 feet, the most difficult and important of it containing tbe two largest bridges and eight of the tunnels being above 15,000 feet.

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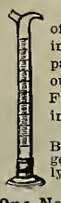

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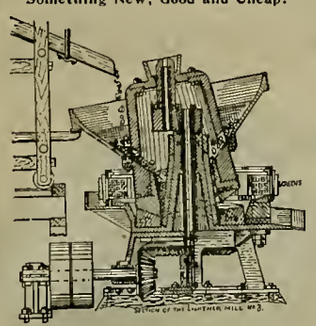

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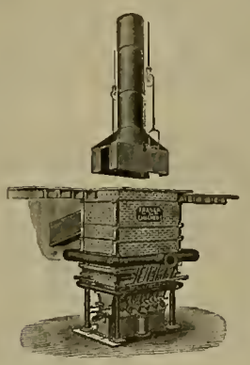

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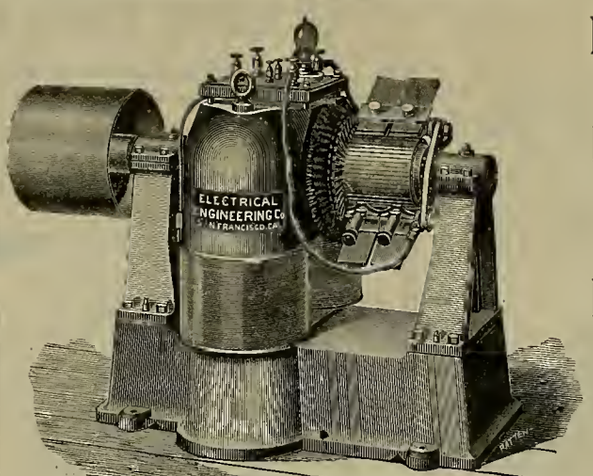

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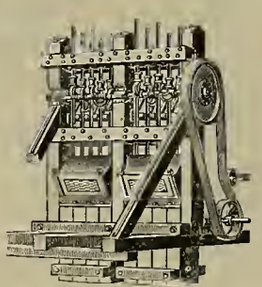

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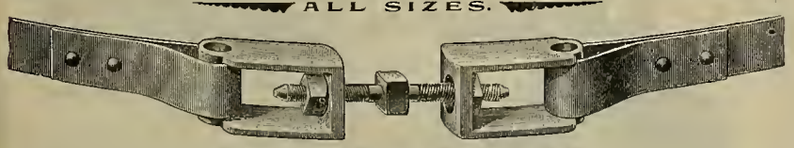

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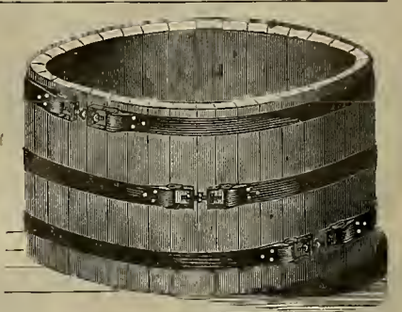

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Market Reports.

The Markets.

SAN FRANCISCO, June 13, 1895.

There was a slight advance in metals during the week. The silver fluctuations appear unaffected by the present political importance of the white metal.

New York Metal Market.

NEW YORK, June 13.—PIG IRON—Scotch, 19@20c; American, 10.00@10.25c.

COPPER — Brokers', 10.62½c; exchange, 10.60c.

LEAD—Brokers', $3.12½; exchange, $3.32½.

TIN—Straits, 14.00@14.20c.

SPELTER—Domestic, $3.80.

New York Silver Prices.

NEW YORK, June 13.—Following are the closing prices for the week:

	Silver in—			
	London.	N. Y.	Copper.	Lead.
Friday	30⅝	66⅞	10 60	.....
Saturday	30⅝	66¾	10 60	3 12½
Monday	30⅝	66¾	.....	3 15
Tuesday	30½	66⅝	.....	.....
Wednesday	30½	66⅞	10 60	3 12½
Thursday	30⅝	66¾	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.88½
London Merchants	$4.86
London Sight Bankers	$4.89½
Refined Silver, per ounce	65c
Mexican Dollars, nominal	53c

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt ¼ & 5-16, 17c; ¾ and larger, 16c			
Lake Superior Sheathing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
COAL.			
SPOT FROM YARD—PER TON.			
Wellington	$ 8 00		
Greta	7 75		
Nanaimo	6 50		
Gilman	6 00		
Seattle	7 00		
Coos Bay	5 50		
Cannel	10 50		
Egg, hard	12 50		
Walisend	7 50		
Scotch Splint	7 50		
Brymbo	7 50		
West Hartley	8 75		
TO ARRIVE—CARGO LOTS.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'	75c ℔ hhl		
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER.			
SAN FRANCISCO — WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00
NAILS.			
Wire			$1 7
Cut			1 5
TIN PLATE.			
Per bx	5 25	@	6 00
PIG TIN.			
Per lb	15	@	16 00
ZINC.			
Sheet	8¼@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do, "		"	1 45
QUICKSILVER.			
Home trade, per flask	39 00	@	— —

San Francisco Stock Board Sales.

SAN FRANCISCO, June 13, 1895.

9:30 A. M. SESSION.

150 Alpha	02	200 Gould & Curry	29
1300 Alta	15	100 Hale & Norcross	91
100 Andes	25	100	92
100 Belcher	39	100 Justice	13
200 Best & Belcher	42	200 Occidental	22
100 Bullion	08	100 Ophir	1 30
300 Chollar	23	100	1 35
200	21	200 Potosi	47
150	24	100 Silver Hill	04
100	22	100 Union	31
500 Exchequer	03		

SECOND SESSION—2:30 P. M.

200 Alta	15	100 Mexican	55
100 Best & Belcher	39	200 Ophir	1 30
500 Bodie	34	500 Overman	16
100 Chollar	20	50 Potosi	42
600	21	150	41
500 Con Cal & Va	2 30	100 Savage	34
300 Exchequer	08	200	35
50 Occidental	30	50 S B & M	14
100	19	500 Sierra Nevada	49
500	17	450 Yellow Jacket	40

Sampling Works for Sale.

The works are situated at Daggett, Cal., in the Calico Mining District, and on side track of the Atlantic & Pacific Railroad. They contain a first-class 50-horse power Engine and 45 horse power Boiler, with Ore-crusher and other machinery, Mill Scales, Assaying Outfit, etc., all nearly new. Also upon the premises an office building and a comfortable dwelling house (portable). The above can be had at a bargain Apply to JOHN H. GILLESPY, 1908 Stockton St., San Francisco.

Mining Share Market.

SAN FRANCISCO, June 13, 1895.

The mining share market does not share in the business improvement manifest elsewhere. Depressed in value and diminished in quantity, the little business done is but a semblance of the past. The interest felt in the yet-to-come Hale & Norcross decision was eclipsed this week by the attention given the Brunswick scheme, which has so far been endorsed by the seven companies who have held meetings relative thereto. The purchase has been approved, the companies also adopting a resolution that "the purchase of the Brunswick lode is not to be construed as an indication of an abandonment of the Comstock lode, or a lack of faith in the further successful development of that lode."

It was stated unofficially on Thursday that instructions have been sent to Virginia City to begin work on the Brunswick at once.

It is reported that Thos. H. Leggett, superintendent of the Standard Con., of Bodie, has resigned to accept a big salaried position in one of the Rand mines, South Africa.

The following illustrates the changes of the week:

MINES.	6	13
Alpha	.....	$ 02
Alta Consolidated	.....	15
Andes	.....	25
Belcher	$ 32	39
Best & Belcher	41	42
Bodie	40	34
Bullion	.....	08
Challenge	19	.....
Chollar	18	24
Confidence	.....	.....
Consolidated California and Virginia	2 35	2 30
Consolidated New York	.....	.....
Crown Point	35	.....
Exchequer	.....	08
Gould & Curry	23	29
Hale & Norcross	88	91
Justice	03	13
Mexican	30	55
Ophir	1 30	1 35
Overman	.....	16
Potosi	35	47
Savage	33	35
Sierra Nevada	49	49
Union	.....	31
Utah	.....	.....
Yellow Jacket	40	40

Assessment Notices.

GOLD BAR CONSOLIDATED MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, La Porte, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 24th day of May, 1895, an assessment, No. 1, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of June, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 22d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

Office—38 Crocker Building, San Francisco, Cal.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of June, 1895, an assessment, No. 2, of 2½ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the corporation, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of July, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 27th day of July, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

CHALLENGE CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the eleventh day of June, 1895, an assessment (No. 19) of Five (5c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the sixteenth day of July, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the sixth day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

C. L. McCOY, Secretary.

Office—Room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the twelfth day of June, 1895, an assessment (No. 45) of Ten (10c) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No. 331 Pine st. cet, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the seventeenth day of July, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on WEDNESDAY, the seventh day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office—Room 20, No. 331 Pine St., San Francisco, Cal.

BIDS ARE ASKED

For Renovating and Enlarging the Pump House of the undersigned, in the Pearson district; for Driving Piles; Concrete Work; New Cross-Compound Engine **Bids opened July 6, 1895.** For particulars apply to

P. J. VAN LÖBEN SELS,

508 Montgomery Street, San Francisco, Cal.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied, Deling't and Sale.*	*Secretary.*
Alpha Con, Nev	14	5c	May 23, Jun 27, July 18	C E Elliott, 309 Montgomery
Alta M Co, Nev	49	10c	May 6, Jun 11, July 2	J E Jacobus, 309 Montgomery
Andes S M Co, Nev	41	15c	May 1, Jun 1, Jun 17	J W Twiggs, 309 Montgomery
Best & Belcher M Co, Nev	58	25c	June 12, July 18, Aug 10	M Jaffe, 309 Montgomery
Bullion M Co, Nev	45	10c	June 12, July 17, Aug 7	R R Grayson, 331 Pine
Challenge Con M Co, Nev	19	5c	June 11, July 16, Aug 6	C L McCoy, Mills Building, City
Chollar M Co, Nev	40	25c	May 14, Jun 15, July 11	C E Elliott, 309 Montgomery
Cold Bar Cons M Co., Cal	1	2c	May 24, Jun 29, July 22	E C Godfrey, Crocker Building
Hale and Norcross M Co	107	20c	May 29, July 3, July 25	A B Thompson, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19, May 31, July 26	J Henry Smith, 431 California
Justice M Co, Nev	59	10c	May 7, Jun 11, Jun 28	R E Kelly, 309 Montgomery
Mexican G & S M Co, Nev	52	25c	May 13, Jun 17, July 10	C E Elliott, 309 Montgomery
Sonora Extended M Co, Cal	2	2½c	June 1, July 6, July 27	C A Stratton, 213 Jackson
Yellow Jacket, Nev	59	25c	Apr 15, May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETINGS.

Company and Location.	*Secretary and Office in S. F.*	*Date.*
Bodie Con M Co, Cal	M E Willis, 309 Montgomery	June 17
North Belle Isle M Co, Nev	J W Pew, 310 Pine	June 26

P. & B. INSULATING TAPE. ARMATURE VARNISH. ELECTRICAL COMPOUND.

STANDARD OF EXCELLENCE—USED IN ALL FIRST-CLASS ELECTRICAL WORK.

Samples and Circulars on application.

PARAFFINE PAINT CO. 116 BATTERY STREET, SAN FRANCISCO. 221 SOUTH BROADWAY, LOS ANGELES.

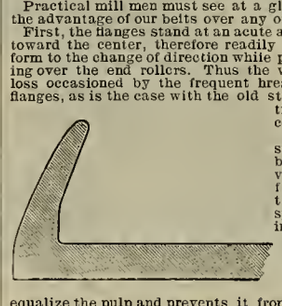
Sole Manufacturers of P. & B. Paints, Roofing, Building Papers.

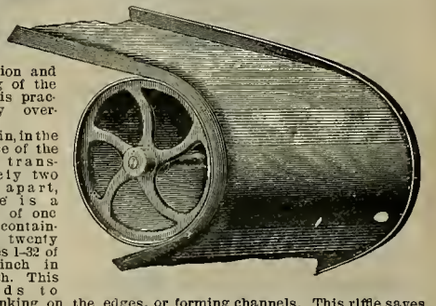
Blasdel Improved Concentrating Belt.

We keep in stock belts suitable for the Frue, Triumph, Johnston and Tullock machines, and make all lengths and widths to order.

Practical mill men must see at a glance the advantage of our belts over any other.

First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.





Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

H. G. BLASDEL, JR., Manager,

419 California Street, Haywards Building ..... **San Francisco.**

THE AMERICAN MINING & MILLING MACHINERY CO.,

121 Euclid Ave., CLEVELAND, O. 280 Caxton Blk., CHICAGO, ILL.

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AM. CRUSHER AND AM. BALL PULVERIZER.

The simplest, cheapest and best machines in the market. Pulverize wet or dry to any degree of fineness. Make little or no slimes in wet nor dust in dry work. Four sizes, capacity from 2 to 60 tons per day.

SEND FOR CATALOGUE

Cable Address, American.

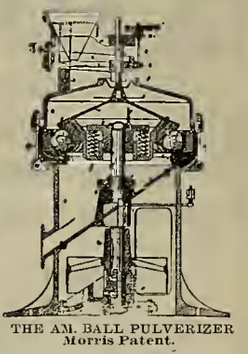
First Prize and Gold Medal Awarded by World's Fair, 1893.

Office of THE CLEVELAND IRON ORE PAINT CO. and THE GARRY IRON ROOFING CO., CLEVELAND, O., Jan. 25, 1894.

The American Mining & Milling Machinery Co., Cleveland, O.:

GENTLEMEN:—We purchased a No. 2 American Rock Breaker and a No. 2 American Ball Pulverizer from your company about one year ago. The latter part of April, 1893, we started up for regular work, since which time we have run both of said machines to the full extent of our demands and to our entire satisfaction. The first 700 tons of hard iron ore that we pulverized for paint purposes was ground without taking the Pulverizer apart, and without expending one dollar for repairs for either of these machines. Of the 700 tons spoken of, about 200 tons was Lake Superior Specular iron ore, containing some 70 per cent iron; a very difficult ore to pulverize. The remainder was a red fossiliferous iron ore, carrying quite a per cent of silex, which cuts out hair-stones rapidly. We find that the steel balls which were when new 5 in. in diameter, now caliper 4⅞ in., and are perfectly round and smooth. The grinding track shows very little wear, and the driving track shows LESS; in fact, the wear is almost imperceptible. These two machines crush and pulverize more than one ton per hour with LESS than 12 H. P. We do not know of any Crusher or Pulverizer that can compare with the output of these two machines in quantity, quality, small amount of wear and tear, and like power. In our opinion, you cannot recommend them too highly. Very truly yours,

CLEVELAND IRON ORE PAINT CO.



THE AM. BALL PULVERIZER
Morris Patent.

REGRINDING VALVES

Reasons why LUNKENHEIMER'S are the best.

On the market for over **35 years.** Made of **Gun Metal** throughout. Every valve tested and warranted. Can be reground while on pipe. Easily taken apart on account of outside thread and union style connection, therefore no "cementing" of hub to body. In long tried use on **Government Vessels, Lake and River Boats, in Rolling Mills, Refineries, Factories, Mills,** etc. **Gun Metal** is the only composition that will stand the screw power of valve stem and make a steam joint., Superior and more durable than valves with **Asbestos or Rubber Discs.** TRY them and be convinced. None genuine unless "LUNKENHEIMER" is cast in the shell. Specify and insist upon "LUNKENHEIMER'S." Catalogue gratis upon request.

THE LUNKENHEIMER COMPANY.
FACTORIES — CINCINNATI, O.
NEW YORK STORE, 51 JOHN ST.
EUROPEAN STORE, THE LUNKEN VALVE CO. 35 & 37 DOVER ST. LONDON S.E.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JUNE 4, 1895.

540,568.—FLUME GATE—N. S. Abrahamson, Redlands, Cal.
540,569.—ELECTRIC RAILWAY—C. M. Allen, S. F.
540,532.—DOOR BOLT—J. E. Armstrong, Santa Cruz, Cal.
540,390.—BARREL HEAD—Burroughs & Roberts, Santa Cruz, Cal.
540,237.—AIR COOLER—J. R. Cook, Ploche, Nev.
540,539.—BRAKE PIPE DRAIN CUP—W. K. Conners, Sacramento, Cal.
540,434.—CAMERA STAND—A. W. Gilfillan, Ferndale, Cal.
540,357.—SAWMILL—D. B. Hauson, S. F.
540,548.—STOVE UTENSIL—F. G. High, S. F.
540,500.—BLEACHING GLUE—J. E. Kunitz, Santa Cruz, Cal.
540,502.—EGG CASE—Leak, Hayford, Merguire & Radgesky, S. F.
540,395.—NEEDLE—Levy & Lindow, S. F.
540,505.—FUEL GAS RETORT—John Marilu, Berkeley, Cal.
540,329.—SAW GAUGE—J. Morlu, Mt. Vernon, Wash.
540,508.—LOCK NUT—C. G. Mortenson, Lorlu, Cal.
540,396.—CAN-HEADING MACHINE—H. Schaake, S. F.
540,561.—MITER—J. M. Schofield Madera, Cal.
540,603.—GAS REGULATOR—E. J. Verrue, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

PIPE.—Henry F. Williams of San Francisco, assignor to the Improved Asphalt Company of Bakersfield, California. No. 540,202. Dated May 28, 1895. This pipe is made of independent annular rows, each row consisting of a plurality of wooden segments, the segments in adjacent rows breaking joints and all adhering together by means of a suitable glue.

AIR BRAKE BRANCH PIPE DRAIN CUP.—Walter K. Conness, Sacramento, Cal. No. 540,539. Dated June 4, 1895. The object of this invention is to provide a protection for the delicate mechanism of the triple valve of an air brake to prevent the entrance of dust when the pipes are disconnected. It consists of an enlarged or bottle-shaped casing having the smaller end connected with a T or passage to the train pipe, an annular enlarged chamber at the opposite end adapted to receive dust and foreign substances entering the chamber, and having a dust receptacle connected with the lower side thereof, a pipe from the triple valve casing entering through the center of the enlarged chamber and extending into the interior beyond the dust chamber, a screen cone fixed upon the inner end of the pipe, and a solid conical button fixed to the smaller end of the cone at the entrance to the chambor so that the air and dust are diverted to pass along each side of the screen cone and air pipe.

COIN-CONTROLLED APPARATUS.—Gustav F. W. Schultze, Berkeley, Cal. No. 540,195. Dated May 28, 1895. The device belongs to that class of apparatus in which a disk is rotated by the deposit of a coin, acting through suitable intervening mechanism, the disk indicating, by its spinning and coming to a state of rest, a desired result or a failure to reach such result. The inventions in the present machine consist in improved details of construction, the general object of which is to render the machine more accurate, more attractive and less susceptible of misuse.

AUTOMATIC TIRE INFLATER.—Philip W. Stanford, New York. No. 540,519. Dated June 4, 1895. This device belongs to that class of automatic bicycle-tire inflater in which the necessary pumping operation is dependent upon and gained by the slight compression of the tire at the point of its contact with the ground. It consists of a valve-controlled cylinder flexibly mounted on the wheel, whereby it may yield under an unequal strain imposed upon its piston rod; a valve-controlled piston in the cylinder; a hollow piston rod communicating with the interior of the tire and bearing against the inner surface of its outer wall, whereby it is moved up, and a spring within the cylinder for returning the piston. In addition, there is also a dust-arrester upon top of the cylinder, and by this the air is properly filtered before being admitted to the cylinder, so that the latter will not become clogged.

DOOR BOLT.—John E. Armstrong, Santa Cruz, Cal. No. 540,532. Dated June 4, 1895. This inventiou relates to the shooting bolts intended to be used independently of a door lock. The object in view is to provide a simple and cheap device which can be readily applied to the door, can be locked and unlocked by means of a key from the outside, and can be positively locked against the action of said key when desired. The device consists of a slidable bolt having a handle, a recess or chamber formed in the door and leading from the recess in which the bolt works out through the inner side of the door; a plate covering the recess and having a curved guide in which the handle of the bolt works, said recess or chamber extending below the handle of the bolt and adapted to receive the bit of a key, whereby said bit, in rising up on either side of the handle, causes a reciprocation of the bolt; and a pivoted stop on the plate adapted to be turned into and out of the path of the handle, whereby the bolt is locked against the action of its own key and is again released.

The Pelton System of Power

Represents the highest development yet attained in water wheel practice and affords the most simple, efficient and economical means of utilizing water for power purposes.

Six Thousand Wheels Now Running,

Aggregating over 400,000 horse power. Adaptation made to all conditions and every variety of service.

Electric Power Transmission.

PELTON WHEELS are the recognized standard for electrical work and are running a majority of the stations of this character in all parts of the world.

Catalogues furnished upon application. Address

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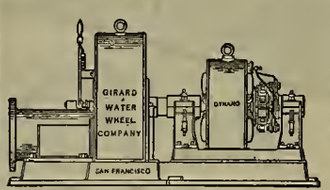
121 MAIN STREET, SAN FRANCISCO, CAL.

American Girard Water Wheel.



Adaptable to all heads between 30 feet and 2000 feet, particularly where economy in the use of water and fine regulation are desired, as, for instance, the operation of electric dynamos.

Girard Water Wheel Co.,

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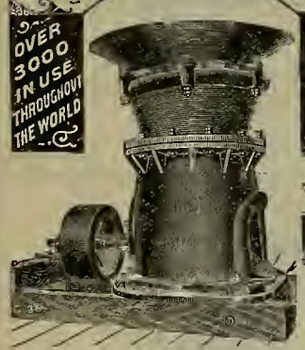
WATER WHEEL

CASCADE WATER WHEEL

Adapted to all heads, from 30 FEET TO 2000 FEET. Our experience of 33 YEARS in the water wheel business enables us to suit every requirement of water power plants. Send for illustrated pamphlet. This new wheel has given an unequaled Economy in Water.

JAMES LEFFEL & CO. Springfield, Ohio, U.S.A.

GATES ROCK AND ORE BREAKER



OVER 3000 IN USE THROUGHOUT THE WORLD

PRODUCES A MORE PERFECT CUBIFORM MATERIAL AND A GREATER QUANTITY IN A GIVEN TIME PER HORSE POWER USED THAN ANY OTHER CRUSHER ON EARTH.

CAPACITIES UP TO 150 TONS PER HOUR. NINE DIFFERENT SIZES.

WE HAVE BUILT THE LARGEST CRUSHING STONE PLANTS IN EXISTENCE

GENERAL MINING MACHINERY

OF EVERY DESCRIPTION.

TREMAIN STEAM STAMPS

Connorsville Blowers, King-Darragh Concentrators, Stamps, Hoists, Rolls, Pans, Settlers, Smelters, Metallurgical Appliances, Etc.

COMPLETE INSTALLATIONS.

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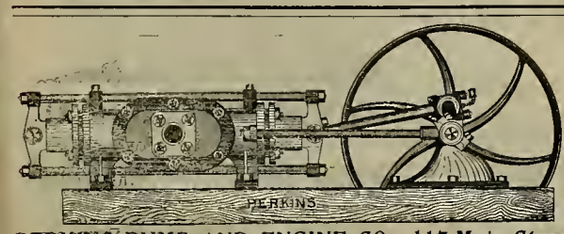

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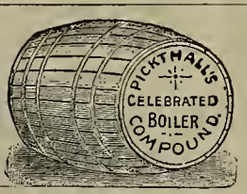
Perkins Double-Acting PLUNGER PUMPS.

Capacity 2000 to 20,000 gals. per hour. Especially adapted for mines. Will raise water any height or distance and can be worked successfully under every possible situation. Pumps sand and water. No cylinder or pistons to wear out. For all particulars send to the

PERKINS PUMP AND ENGINE CO., 117 Main Street, San Francisco.



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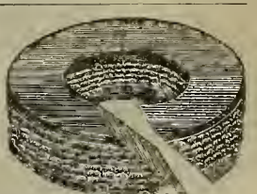
Celebrated Boiler Compound
—FOR—
Removing or Preventing Scale, Corrosion and Pitting in Steam Boilers.
Will save its cost in fuel, boiler repairs or labor.

Vulcanized Fiber Valves
—AND—
Ordinary Rubber Valves,
For Hot or Cold Water.
Pure Rubber Air Pump Valves.
Combination Ring Packing
For Piston Rods of Engines, Steam, Water or Ammo. ia Pumps.
FLAX PACKING
—AND ALL—



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Johnston's Concentrator, Bryan Mills,
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MINING, MILLING, PUMPING and HOISTING PLANTS.

HUNTINGTON CENTRIFUGAL ROLLER Quartz Mill.

TUSTIN'S PULVERIZER, WORKS ORE Wet or Dry

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MINING AND MILLING MACHINERY.

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MAIN WORKS: Harbor View, San Francisco.

IMPROVED CRAWFORD MILL.

The Cheapest and Best Mill for extracting gold from comparatively free milling ores. Requires one-third the water, and three-fourths the power of stamps. Costs less, is operated cheaper, and will save 20 to 40 per cent more gold. Average saving 85 per cent. Inexpensive foundation. No plates or screens. Wear and tear guaranteed not to exceed thirty cents per ton. Capacity ten tons. Full particulars,

MECHANICAL GOLD EXTRACTOR COMPANY,
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VOLUME LXX. Number 25.

SAN FRANCISCO, SATURDAY, JUNE 22, 1895.

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Marine Engines.

The renewed interest in marine engines on this coast, the great lakes and the gulf makes timely illustrated reference to some styles that attract deserved attention.

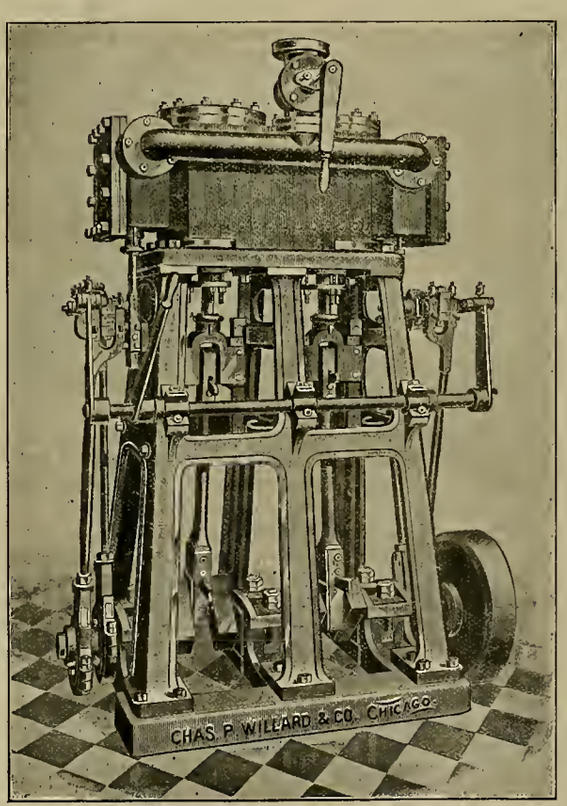
The steeple compound engine shown in the engraving is 8 and 16x8, compact, taking up little room in the boat, and equal in efficiency to corresponding sizes of fore and aft compounds. In smaller sizes the high-pressure cylinder rests directly on the low-pressure cylinder cover, the piston rod working through a bronze sleeve.

The illustration of the yacht engine, open-frame style, shows a type of marine engine popular with yachtsmen, on account of its simplicity and the great accessibility of its various parts. One side of the frame is of cast iron, with locomotive slides; the other side is supported by a wrought steel column, leaving one side entirely open and free of access.

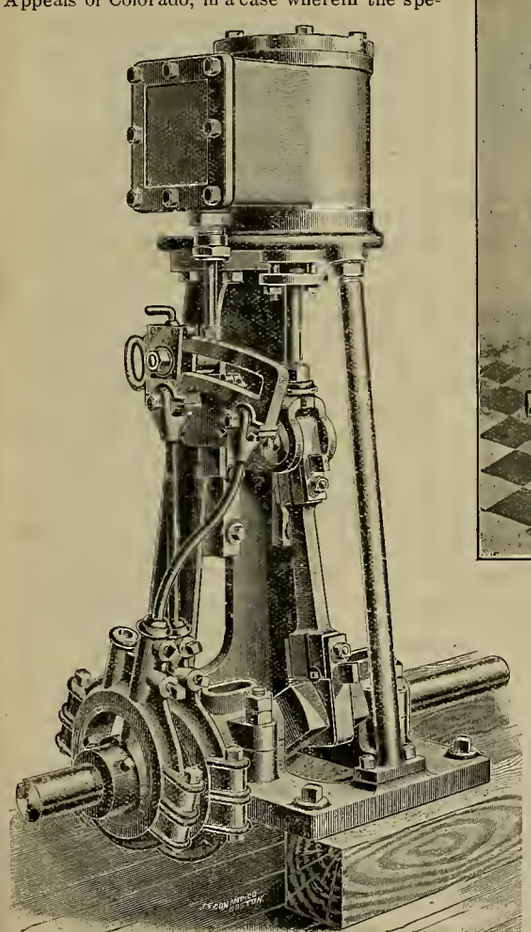
The cut of the 65-foot steam yacht graphically depicts a style of craft that combines the useful and the ornamental in an eminent degree.

The illustration of the duplex high-pressure marine engine shows style of frame of fore and aft compound engine as usually built.

SIXTY-FIVE-FOOT STEAM YACHT.



DUPLEX MARINE ENGINE.

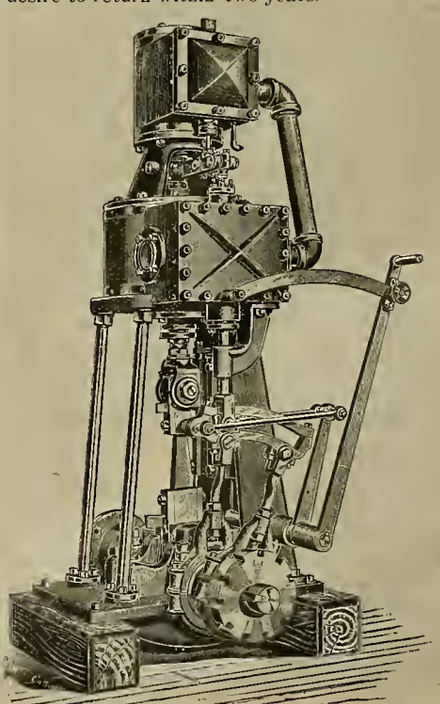


YACHT ENGINE, OPEN-FRAME STYLE.

In the case of Hagerman vs. Bates the Court of Appeals of Colorado, in a case wherein the specific performance of conveyance of a mining claim was the question at issue, has decided that "specific performance of a contract to convey part of a mining claim will not be decreed where it appears that when the contract was made the value of the land was unknown, but was possibly, if not prospectively, great; that the parties now seeking performance waited two years after the other obtained a patent and deed should have been made before bringing suit; that they were then advised that their claim was disputed, and deed would be refused; that they permitted the suit to lie dormant five years, when they filed an amended bill; that in the meantime the others developed the mine into a very rich one, and that transfers were made without objection, and permitted work to be prosecuted without taking any steps to restrain trespassers or assert their rights; and that even after filing amended bill did not prosecute their suit with reasonable diligence. The mere fact that suit was brought within reasonable time does not prevent application of the doctrine of laches, where there is a want of diligence afterwards."

The Victoria, B. C., *Colonist* reports that a vein of free-milling gold ore has been found 16 miles from Vancouver. In North Vancouver there are deposits of iron pyrites running $6 and $7 gold to the ton. It would cost about $8 to extract the gold. In Professor Dawson's report on the mineral lands of British Columbia it is stated that gold had been taken out of Seymour creek in paying quantities, but work had been afterward abandoned on account of the great expense of getting the gold from the creek, the bed of the river consisting of boulders buried beneath several feet of quicksand.

The South African mine owners have taken many of our best California gold miners, and whenever they want a man to successfully manage one of their properties they naturally look this way. They have a very seductive argument, offering the man they want considerable solid inducements. Robert Curnow, who used to be a Nevada county miner, of late years engaged at the Treadwell mine, Alaska, is one of the recent acquisitions. He says: "It is a long distance, but the inducements held forth are so tempting that I have accepted." Mr. Curnow will get $10,000 a year, house, board, servants, horses, etc. The company will pay his passage both ways if he should desire to return within two years.



STEEPLE COMPOUND ENGINE.

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J. F. HALLORAN.....General Manager

San Francisco, June 22, 1895.

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THE PRESS doesn't want any miner to forget for want of being told that the suspension of assessment of '93 and '94 does not apply to '95, and that to hold an unpatented mining claim in any State or Territory in the Union $100 worth of work or improvement must be put thereon some time between January 1st and December 31st, 1895, inclusive.

THE Sacramento *Record-Union*, inaccurate as usual, says that at the recent meeting of the Executive Committee of the Cal. Miners' Association, a proposition was made by the Railroad Co., and declined, and then goes on for a column or so using the allegation as a text. The assertion is about on a par with that paper's recent utterances. The fact is no proposition was made. A gentleman present said he was authorized to make a proposition; that was all. This being the case, what becomes of the elaborate argument of the *Record-Union* based on the false statement?

AT the time the famous land office rules of July 9, '94 were published the PRESS was informed, not officially, but in a way that was almost authoritative, that the real intent was to compel dilatory holders of mining claims to secure U. S. patents. 'Twas thought then that, like Providence, Mr. Smith's department moved in a mysterious way its wonders to perform, but it was believed then and since that it is no part of governmental function to punish poverty or push the dilatory, and that the real reason was to pave the way for the wholesale grab that is now being made, whereby the railway corporations seek to absorb unjustly so great a part of the mineral area of the commonwealth.

AT last week's meeting of the Technical Society of the Pacific Coast President Dickie read a paper on "Engineers; Consulting, Inspecting and Contracting—Their Relation to Each Other and to the Public," which was generally discussed. Among several other good points made in the discussion of Mr. Dickie's clever paper, was the one that rarely, if ever, in works of fiction was an engineer portrayed as dishonest, and whatever other trade, calling, vocation or profession ascribed to "the villian" of the novel, he was not designated as an engineer. The same honorable fact holds good in the realms of fiction regarding "the honest miner." Few, indeed, are the plots or plays in which the miner appears as a maleficent individual, and their names are legion of works of popular fiction, both read and acted on the stage, where the miner, in deeds of daring or benevolence, is the hero and central figure of the plot.

The Mineral Land Fight.

During the week it has become evident that the other ten protests filed by the California Miners' Association against railroad selection of mineral lands will be dismissed the same as the one reported in last Saturday's issue, on the same technical construction—"not specific." These protests cover 600,000 acres of mineral land. Land Commissioner Lamoreaux allows sixty days for an appeal to the Secretary of the Interior. The appeal papers in the first case of 24,900 acres in the Los Angeles district have been forwarded. It denies Commissioner Lamoreaux's jurisdiction; shows that, according to the rules made by the Secretary of the Interior, it is maudatory on the Commissioner to order a hearing whenever such protest is received; and argues that the matter is not within the jurisdiction of the Land Department, and that the whole thing is *ultra vires*. In case Secretary Smith dismisses the appeal, which is very likely, the matter will be again brought to the personal attention of President Cleveland.

At the meeting of the Executive Committee of the Association in this city on the 6th inst., Secretary Ralston said that in some individual cases in which he was personally interested he was going to fight the matter in the courts. This is probably what it will come to at last. These great questions always result in adjudication by some court of last resort, the same as the whisky trust or the Income Tax law, and, though tedious, it is probably the surest way to make direct issue and secure final result.

The question is a simple one: which is dominant, the railroads or the law? If the former, it is probably as well to have it authoritatively stated; if the latter, the sooner it is determined the better. The administrators of the law seem singularly unanimous in the belief that the railroad's interests are supreme; it is time now to see what the interpreters of the law think about it. There are three branches to our Government—the legislative, executive and judicial. In this case of the people vs. the railroad corporations the legislative enactmeut was very plain for the miner, the grant that gave so great a slice of the public domain to the railroads expressly excluded mineral land. So far that was all right. But the well meaning law makers only form one branch of the trinity of governmental power. The executive department stepped in, and in July, '94, a code of rules of procedure was adopted that undid the work of the law makers. The Secretary of the Interior may be "unawed by influence and unbribed by gain." Probably he is honest. But he and his subordinates in the Land Office are doing, perhaps out of goodness of heart, what is worth a great deal of money to the railroad company to have done just the way it is being done by the Government officials—the executive branch of the Government. There is one remaining department of the Governmeut—the judiciary. That is supreme, dominating the other two. To that the people have never yet appealed in vain. To its decisions, whether favorable or unfavorable, all must give assent. It is to this tribunal that the miners of California will finally submit this case for final determination. Protected by the law makers, sold out by the men who put the law into force, the California miner has left the promise of justice from the law definers.

A protest intended to be "specific" enough to satisfy all quibbles in Washington has been filed at the Sacramento land office this week against the granting of a railroad patent to land notoriously mineral in character. In this tract, alleged to be "agricultural" by the railroad applicants, are fifty-two hydraulic and placer mines, some now in operation, many of them well-known gold producers, and some already patented under the mining laws. Included in the railroad company's application are sections 23, 27 and 33, fractional parts of section 31, township 14 N., range 13 E., Mount Diablo meridian, containing 2565.60 acres; section 9, township 13 N., R. 13 E., M. D. M.; north half section 3, lots 1 and 2 northeast quarter south half of northeast quarter, lots 3 and 4 northwest quarter, southeast quarter of northwest quarter, northeast quarter of southwest quarter, south half of southwest quarter and southeast quarter of section 5; north half section 7, sections 9, 15 and 17, township 13 N., R. 12 E., M. D. M., containing 3441.42 acres, and section 13, township 13 N., R. 11 E. Among the mines therein located are the New York placer, the Emerald placer, the Wieland, the Georgia, Arizona, Garnet, Wyoming and Utah placer mines, the patented Clysdale mine, the Poland and Ramsey, the Oregon, Colorado, Amethyst, Montezuma placer mine, Mikado placer, Deadem placer, Caliope, Summit, Diana and Bunker Hill; Hillside, Sunnyside, Treasure, Eclipse, Delaware, Sapphire, California, Nevada, Idaho, Texas, Agate, Opal, Ruby, Turquoise, Topaz, Corcoran and others.

All these, the railroad company claims, are "agricultural land," not in ignorance, but defiance of the law and the facts, the defiance being aided by the previous and present efforts of the Land Commissioner to twist and turn his own rules so as to give the miner no chance and the corporation every opportunity. Accompanying this protest are photographs showing the mines, men at work thereon and other visual proof of the truth of the protest and the assertion that the ground is mineral. If that is not mineral ground, then there is no mineral ground in this State or any State in the Union. The ground specified has been worked for 30 years, and hundreds of thousands of dollars have been extracted therefrom. Never in all the history of corporate greed and disregard of facts, statutes or justice has there been a more flagrant infringement on right or a more brazen effort to acquire what the law specifically exempts.

The railroad newspapers are still in full cry and stop at no misrepresentation or falsehood. Their columns teem with misrepresentation, and hundreds of copies go daily to the land department at Washington. All sorts of influence are brought to bear, and all manner of unjust motives ascribed to those who work for the public right and the miners' just claims. The issue is clearly defined and must be fought to a finish. It is the duty of every miner in the State to aid in forcing it to a successful termination. Enough has been said and done to show that the Washington authorities are fully aware of the illegality of the railroad effort, and cannot plead ignorance of the facts. That they continue to use their almost omnipotent influence on the side of the railroad is presumptive evidence of complicity therein. But if beaten in the executive branch of the Government, the miners have still left the court of final resort, and to this the matter will eventually come.

AT the time the proposed constitutional amendments were adopted by the voters of this State last November the statement was made that the "alien amendment" prevented foreigners from owning or holding real estate. In response to individual inquiries received by this paper from Englishmen resident in London, who contemplated buying California mining property, the matter was given considerable study and the statement finally made in these columns that the adoption of the amendment did not militate against such acquisition, and that no obstacle had been created to prevent aliens from holding mining ground in this State. Since then the question has been referred to the State Attorney-General, who officially states that "the only effect of Article I, Section 17, of the Constitution, as amended in 1894, is to 'prohibit the Legislature from depriving resident foreigners of any of the rights enjoyed by native-born citizens with respect to acquisition, possession, enjoyment, transmission of inheritance of property,' other than real, or of the ownership of real property owned by them when the amendment was adopted; that the resident alien is secured by the Constitution in these particular privileges, but he may be secured by the Legislature in as many more as it chooses to give; that 'there is no provision of the Constitution which prohibits the Legislature from conferring the same (or other) rights upon' non-resident aliens, or extending the privileges of resident aliens; and that, therefore, the amendment does not affect prior legislative enactments conferriug property rights upon resident and non-resident aliens, nor does it deprive the Legislature of the power to add to the privileges secured by the Constitution to resident aliens in any manner that it may see fit. In other words, the rights heretofore conferred by the Legislature upon all aliens, resident and non-resident, remain in full force until repealed or abridged; and the only re-

striction placed upon future legislation on this subject is that no law can be enacted which will abridge the constitutional rights of resident aliens in property other than real estate, or in real property owned by them when the amendment was adopted," which would seem to be sufficiently conclusive and satisfactory.

On April 6th this paper notified its Montana readers that in that State, after July 1st, the Montana "prospector must sink a hole at least ten feet deep in solid formation, must have at least one defined wall, and must stake his ground so that the stakes can be found. The notice of location must be placed conspicuously at the discovery shaft, where it can be seen—not on the stump of a tree in the neighborhood. He is allowed ninety days in which to do this work. If he relocates an old prospect hole he is required to sink it ten feet deeper than when he first found it, and takes and records it the same as though it was an original discovery. If he runs a tunnel it must be at least ten feet long, so as to determine the fact that a vein supposed to carry the precious metals has been discovered." A Butte mining paper, recently started, copied the item, along with a good many others, forgetting to give credit, and after awhile a Deadwood, S. D., paper copied it from the Butte paper, leaving out the word "Montana." Then a city contemporary published it verbatim as it appeared in the Deadwood paper, and several interior journals have copied it, with the result that every mail brings inquiries. Usually the clipping is sent with the words, "How is this?" or similar legend appended. The matter is mentioned merely to say that the facts are as published in the PRESS of April 6th. The requirements specified apply only to the State of Montana.

Concentrates.

THE Cœur d'Alenes are turning out 1000 tons of ore per day.

DENVER papers say that there will be no postponement of the Mining Exposition. It will open, according to announcement, in July, 1896.

THE Blaine Mining Company will build a smelter at Leavenworth, Or., with 100 tons daily capacity, to be in operation inside of twelve months.

THE *Enterprise* says the Dayton dredge is now at work pretty close to the Douglass mill, and is scooping out considerable amalgam as well as high-grade sulphurets.

THE Great Northern Gold Mining Company has incorporated at Spokane, Wash.; capital stock $500,000. The High Ore Gold Mining & Smeltiug Company has also incorporated there; capital stock $500,000.

THE Oroville *Register* in speaking of several mines in Butte county, names the Old Pioneer, at Grass Flat, which, it asserts, "has fifty men at work, and which is taking out $80,000 per week." Some of the figures seem to need revision.

THE sulphuric acid used by the De Lamar Company, Ferguson district, Nevada, is shipped to Milford, Utah, in large tanks, each holding 65,000 gallons. It is then pumped into smaller tanks and shipped by wagons 160 miles across the desert.

THE Union and Companion mines in Cornucopia district, Oregon, were sold in Baker City this week to W. J. Clark, of Butte, Mont., and John E. Searles, the manager of the sugar trust, for $45,000—$20,000 for the Union and $25,000 for the Companion.

ALL the buildings except the hoarding-house at the Butte King mine, twenty miles from Powelton, Butte Co., were burned last week. The mine is owned in this city, and active operations were to have heen hegun this week. The buildings will be rehuilt.

IN the North Fork mines, Plumas Co., J. P. Welch is running a tunnel in the Glazer mine. Col. Day has about closed a deal for the Sunnyside with an Eastern company. F. Scott is making the King mine pay, and considerable development work is being done.

THE Golden Fleece Mining Co., Lake City, Col., is reported to have been robbed by its employes and others of over $100,000 worth of high-grade gold ore. The management has shut the mine down and will spend considerahle money in investigating the wholesale thefts.

THE Hudson Bay Mining Company has incorporated at Grass Valley; directors—M. Ford, A. McDonald, A. Mullee, J. Southern, S. P. Adams, W. Provis Jr. and M. A. Murphy; capital stock $1,000,000, divided into 100,000 shares, of which 55,100 shares have heen subscribed.

THE Condor mill at Condor canyon, Lincoln Co., Nevada, was hurned last week. It was a fifteen-stamp mill, the property of J. Neshit & Brother, and it had heen shut down for a year. Nobody was living at or near the mill and the work is supposed to be the fire of an incendiary.

THE transfer of the twenty-five claims in the Silver Star, Esmeralda Co., Nevada, district to Senator Wolcott of Colorado took place at Carson during the week. The price paid was $600,000. Mr. Wolcott and his associates intend to spend considerable money in development.

AN alleged submarine gold find off San Clemente island, about 100 miles west of San Diego, Cal., forms a pleasant variation in sea-serpent and buried-treasure stories. The newspaper accounts say the gold won from the waves "is of fine quality and entirely free from quartz."

THE "rod man" is reported circulating in Colorado mining Camps. He has sublime faith in himself but is a fake, nevertheless. The man who buys his services and quits there only loses what he pays him, but every dollar he spends in developing the ground indicated is usually an additional loss to the believer.

NEXT Friday the Elizabeth Mining Company's properties in Granite county, Montana, comprising eight quartz claims adjoining the Bimetallic mine, will be sold at sheriff's sale to satisfy a judgment of $8000 in favor of the St. Louis Union Trust Company. The shut-down of the Bimetallic has caused the Elizabeth mine to fill with water.

E. W. WOODRUFF, paymaster for the Nacasari Copper Company, Sonara, Mexico, while traveling by buckboard to Nacasari from Bisbee, A. T., with money to pay the employes, was attacked by masked men near Cachuta, about forty miles south of the Arizona line last Thursday, Moreno the driver, was killed and $6,000 was taken by the brigands.

THE Merced *Star* says the old French mine in the mountains above Madera will soon be the scene of lively work again, as capitalists have control of it and are about to resume operations. The property has remained idle for several years, and a great deal of money bas been sunk in its development. It is claimed that the mine is a good property if properly handled.

THE Altoona Quicksilver Mining Company is reducing about twenty tons of ore per day and producing ninety flasks of quicksilver per week. The snow has entirely disappeared and they are able to sun-dry considerable of the ore which comes from the ledge in the form of thick mud, and which must be dried before it can be placed in the roasting pans and retorts.

DIRECTOR OF THE MINT R. E. PRESTON estimates the world's production of gold for 1894 to approximate 8,870,518 fine ounces, valued at $181,510,100, as against $158,836,000 for 1893, showing an increase during the year of $22,674,000. The greatest increase in the production of gold during the year were: Africa, $11,400,000; Australia, $6,073,000; United States, $2,500,000; Mexico, $3,195,000.

THE Eureka Consolidated mine on the Forest Hill divide, Placer Co., one of the most valuable mining properties in the State, is about to pass into the hands of Eastern people, if the price can be agreed upon. There are 275 acres, and nearly seven miles of ancient channel. Over $30,000,000 has been got out of the divide, and a good many think considerably more than $30,000,000 additional will be secured from the same locality.

THE Prospect Mill and Mining Company (Directors—C. A. McQuesten, A. E. Phelan, E. C. Barclay, V. Schmidt and M. M. Davis; capital stock $50,000, of which $40,020 has been subscribed), and the Piedmont Gold Mining Company (Directors—W. W. Stone, D. Holse, C. Geisler, W. Marxsen, H. Bruns; capital stock $1,000,000, of which $5000 has been subscribed), incorporated in San Francisco this week.

LIEUTENANT GILLETT says that the U. S. Debris Commissioners are determined that no hydraulic mine shall he operated unless the owners conform to every requirement of the law and orders of the Board. That is right and proper and will be endorsed and observed by every responsible hydraulic miner in the State. The miners agreed to uphold the law and are doing so. 'Tis the anti-debris people that are opposing its provisions and practical operation.

A NEW silver ore has been found in Felsobanya, Hungary. It occurs in short prismatic crystals, belonging to the orthorhombic system; luster metallic; color dark lead-gray or steel-gray to black. An analysis gave the following result: Sulphur 23.32 antimony 41.91, lead 22.07, silver 11.31, copper 0.69, iron (zinc, manganese) 0.70, insoluble 0.04,=100.04. The percentage composite required by the formula $AgPbSb_3S_6$ is as follows: Sulphur 22.14, antimony 41.52, lead 23.88, silver 12.46 =100. The name Andorite has been given to the mineral.

ACCORDING to a Butte county paper, the following is a verbatim copy of a mining location recently sent in at Oroville, and, as the fees were paid, it was duly recorded: "The undersigned clams this clame non as the Hurd Clame, the cabin stove and fictures for cooking also the water for mining purposes located on Alder Creek." Spelling is largely a matter of private judgment, but accuracy of description of the property claimed is necessary. There are rules and requirements for properly locating mining ground which should in all cases he exactly complied with to avoid vexation, contest and probable loss.

SUIT has been brought in Denver, Col., by T. D. Kelley, asking for a receiver for the Little Johnny mine, and that he he awarded a one-sixth interest in the Leadville Bonanza mine. He asserts conspiracy and fraud were used to get his rightful interest in those mines away from him and others he represents and that $1000 was all he got for such interest. Incidentally, the statement is given great prominence that the property is worth "from $50,000,000 to $100,000,000," that "it is a wonderful bonanza, paying millions of dollars profit," etc., all of which doubtless has a commercial value to all parties interested.

THE hig Anaconda Mining Co. reincorporates to-day, uuder the name of the Anaconda Copper Co., with a capital stock raised from $12,500,000 to $30,000,000. It is understood that the great concern is increasing its capital stock with the purpose of placing some of it on the market to raise money for development work on its new properties, and for the erection of a big refinery. The formal reorganization takes place to-day, and the company's vast properties in Montana will be transferred to the new company, including its Anaconda townsite, hotel properties, stock ranch, railroads, street railways, mines, smelters, reduction works, saw and planing mills, waterways, reservoirs, canals, electric light plants, telephone and telegraph lines, etc. The company is at present enlarging its smelters and erecting hig sampling works in Butte.

IN last week's issue of the PRESS was puhlished the full text of the bill prepared by the legislative committee of the State Miners' Association for passage by Congress. Another hill has been prepared which will also be submitted to our California representatives in hoth houses for their approval and promised support. It makes provision for appropriatiou of $1,030,000 to be expended under the direction of the Secretary of War, in accordance with the plans and specifications of the Debris Commission, for the construction of works for the restraining and impounding of mining debris upon the tributaries of the Sacramento and San Joaquin rivers in this State. This matter was fully discussed and affirmatively treated at the convention last November, and the action of the legislative committee in this regard is in accordance with the resolutions then adopted.

F. W. BRADLEY, manager of the Bunker Hill and Sullivan mines at Wardner, Idaho, says he will reopen those mines on the terms proposed by the citizens and business men of that place; he will pay $2.50 and $3 a day, and whenever silver and lead advance in price wages will be advanced; will employ union men, but will not recognize the union as an association. He says his intent is to do considerable development work and permanently operate the mines; will hire men who live in Wardner in preference to outsiders. If he can do this he will go ahead; if not, the mines will be shut down finally.

THE O. K. Gold Mining Company has incorporated in Spokane, Wash.; capital stock, $1,000,000. The company is established permanently at Spokane. Trustees are named to serve until the first Wednesday in December next: I. Y. Cole, D. J. Hughes, C. P. Ondin, J. E. McCall and J. W. Kiley, all of Spokane. The purpose is to own and operate mineral properties in the United States and British Columbia; to maintain mills, smelters, concentrators and reduction works; to operate ferries, railroads and other means of transportation, together with tramways and all the facilities for carrying on the business of mining.

THE Ibex, Utah, Mining and Smelting Company, of which F. L. Underwood is president, has gone to pieces. A year ago this syndicate took a hond on the Ibex mine in Detroit district for $135,000, and then expended $80,000 on a smelter. After paying $15,000 on the mine and putting the smelter in operation the company encountered financial difficulties and the smelter was attached. A receiver has been appointed while the mine has reverted to the original owners. It is a good property and it is alleged that the Underwood people extracted $300,000 worth of ore while it was in their hands. Extravagance and mismanagement are said to have been the causes of the company's failure.

THE following are recent Colorado incorporations: Crooke Reduction Company; capital stock, $100,000; a New Jersey corporation; office, Colorado Springs. Colorado M. and M. Co., to operate in Arapahoe and Boulder counties; capital stock, $500,000. O. H. P. B. M. and M. Co.; office at Pueblo; will operate in El Paso county; capital stock, $600,000. Bouanza Cripple Creek G. M. Co.; capital stock, $500,000; will operate in El Paso county, with headquarters in New York City. Nellie Bly G. M. and Reduction Co.; capital stock, $100,000, Boulder county. Copper Queen Leasing and Mining Co., Colorado Springs; will operate in Park, El Paso and Jefferson counties; capital stock, $100,000. Nashville Leasing Co.; capital stock, $500,000; to operate in Gilpiu county.

—The long-delayed suit of the U. S. vs. the North Bloomfield Gravel Mining Co. was begun in the U. S. Circuit Court in this city this week. The question at issue is not an allegation of damage to any navigable stream or its tributary, occasioned hy the working of the mine. The suit of the Government is to compel the company to comply with the Caminetti law, it being the only considerable hydraulic mining corporation that has refused or neglected so to do, and the result of the suit involves the validity of the Caminetti act and the constitutionality of the Debris Commission. The matter has been exhaustively discussed out of court, and whichever way the decision goes it will be carried finally to the highest tribunal in the country.

P. A. O'FARRELL writes from Rossland, B. C., confirming what was recently said in this column about the Trail Creek mines, and which was assailed as being "incorrect and unjust." He says: "Labor will have steady and continuous work in these mountains for generations to come, hut money is needed to pay that labor, and capital must receive the big reward from these mines. Great veins of ore are everywhere, but the rich-paying ore bodies are necessarily scattered, and the successful mine operator is the man who knows where to find these rich ore bodies. Moreover, the growth of Rossland and the largest development of these mines will depend on the building of smelting plants right at the mines. It costs $8 or $10 a ton to haul the ores to the smelter in Montana or at Tacoma, and consequently only ore worth at least $20 a ton can be profitably mined. The moment, however, reduction works are built here, $12 ores can be worked at a profit." Just so.

THE following is from the latest issue to hand of the London, England, *City Leader*, which at least shows kiudly intention: "It would seem that Californiia mining industry is to have a new lease of life. A well-known San Francisco lawyer is just now in Washiugton with the idea of bringing about a settlement with reference to the railroad land grants which covers mineral territory. He represents the State Miners' Association of California, which announces its willingness to secure lands for the railroad in lieu of those which it might lose on account of their mineral character. There are, we understand, persistent inquiries from England for California gold mines, and there are at least two contemplated sales, each of which involves $2,000,000. According to the same Association, California is being overrun by people searching for properties, and it is the belief of capitalists that California is one of the greatest gold fields in the world. It would seem, therefore, that when the Kaffir boom, the West Australian boom, and other like booms that are in contemplation are over, we may look for another California boom."

DISSATISFIED shareholders in the Bodie Mining Co., acted last Monday at the annual election. Their alleged grievance was that during last May there was shipped to the mill for reduction 525 tons of gold ore from which the pulp assays, less the value of the tailings, showed a valuation of $17,989.21. The bullion returns from that were $23,351.09, showing a gain of $5,361.88. The average value of the ore returned in bullion was $44.47 per ton, and the average loss in tailings 16¼ per cent. The amount recovered from the final clean-up was 23 per cent of the net bullion yield. The loss in the tailings was 16¼ per cent against 8¼ per cent and 4¼ per cent on two former runs. The value per ounce of the bullion from this run was but $4.90 28-100 against $9.34 2-100 per ounce last June, $11.42 89-100 per ounce last September, though the ore crushed last was taken from the same workings as that crushed in the proceeding June and September. The result of the election was that the opposition was beaten, but was conceded three of the seven directors. The annual financial report showed that the total receipts from all sources were $141,498.60. The bullion reduced yielded $122,469.34 and three dividends, amounting it all to $66,660, were paid. The mine expenses account for the year was $24,576.64. The New York agency of the company was abolished.

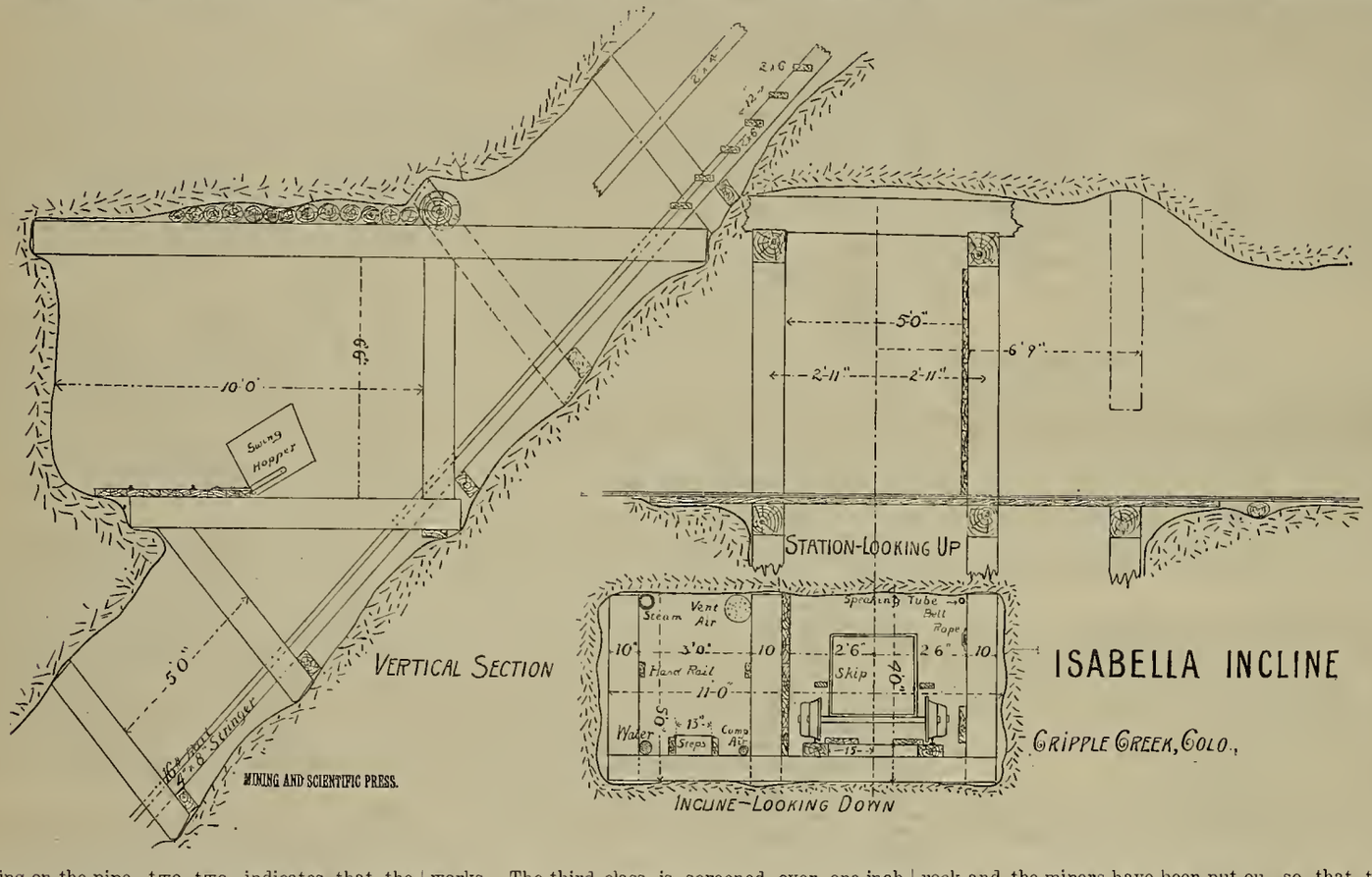
Timbering in the Isabella Incline.

Written for the MINING AND SCIENTIFIC PRESS by FRANCIS T. FREELAND, Aspen, Col.

The accompanying drawing shows a convenient and economical method of timbering an inclined skip-shaft and station, together with the dimensions used, designed for the Isabella Gold Mining Company, Cripple Creek, Col.

The shaft follows the vein, and, as the walls are good and the vein hard, stulls and not sets are used. The automatic dumping skip holds twenty cubic feet, although the mine cars hold but fifteen, in order to prevent any spilling when loading. The sixteen-pound rails are laid on four by eight-inch stringers on four by eight-inch cross-sills, with guide-planks and side-planks. This renders derailment and wedging infrequent. For hoisting water the skip has two flap-valves in the end, which are replaced by a dead-plate to prevent injury when hoisting rock. The skip is tagged to indicate the kind of rock and dumps into cars at the surface.

The quarter-inch wire bell rope runs in side pulleys. The 1½-inch iron pipe speaking tube is used to prevent the skip being rung away when in use, thus:



Pounding on the pipe, two, two, indicates that the skip is wanted and about to be moved, and an answer, one, means that it is in use. Conversation can also be carried on. Steps for this grade are much better than ladders. They have a six-inch tread, twelve inches on the slope, and two hand rails.

The ventilation for dead ends is forced by a No. 3 Sturtevant monogram blower, driven by a small engine. The main shaft pipe is No. 24 galvanized iron, eight inches in diameter, with telescope joints, secured by hook lugs and wire. At each level is a cross, with six-inch No. 27 pipe in the levels and four-inch in raises or stopes. The greater part of the mine is ventilated by an air shaft and winzes at either end, the natural current being controlled by airtight doors where necessary.

At the station the track of the level simply bows out over the shaft and the mine cars dump directly into the skip through a swinging hopper. The main station cap and lagging overhang the long spreaders. The timbers are round and hewed next the shaft and floor.

A word as to the character of the ore deposit and the method of mining will show the reasons for this design. The vein is a fissure in andesite and andesitic breccia, traversed by diorite and phonolite dykes. Its width is from a few inches to a few feet, and it assays from one-half to thirty ounces gold per ton. The ore is mostly quartz carrying free gold and tellurides in depth.

It is worked by overhead stoping. The mill holes are three feet wide and twenty-five feet apart and provided with flat chutes five feet nine inches above the track. The main line of stulls are set eleven feet above the track. The mill holes are cribbed or stulled and lagged, and the stopes filled with waste or stulled, according to the width of the vein and the waste available. The ore is broken on canvas protected by old plank.

Very few face samples are taken, as they are often misleading. Large grab samples are taken from the heaps in the chutes at night. Early in the morning they are run through a small power crusher, and cut down and sent to the assay office, the results being known at noon. As a mine of this sort makes but little dirt, one hoisting shift is sufficient except when sinking, although the stopes are worked two shifts by day's pay and the levels three shifts by contract. The drilling is mostly single-handed.

In the morning, water, waste or known kinds of rock are hoisted. At noon each trammer is furnished with a memorandum showing the number of the mill-hole and the proper skip tag. Over two ounces is first class; one to two ounces, second class; one-half to one ounce, third class; one-quarter to one-half ounce, fourth class; and less than one-quarter ounce, waste. The first-class is screened over three-quarter-inch grizzlies, carefully hand-sorted on tables and shipped as fine and coarse to the lead smelters. The second class is screened over seven-eighths-inch grizzlies and sold to chlorination works. The third class is screened over one-inch grizzlies and sent to a custom stamp mill. The fourth class is screened, without sorting, over 1½-inch grizzlies. The fines make good stamp-mill ore, and the coarse goes direct to a waste dump, as sufficient available fall allows this without handling. It is evident that with this method of classification, pockets at the stations and head of the incline would be of little advantage.

In sinking for a new level the order of operations is this: The shaft is carried down by a temporary track without timbering for 100 feet. At seventy-five feet the new levels are sent away for fifteen feet from a temporary plat. The station is started and the floor sills set and rough-lagged. The temporary track is taken up. The shaft is trimmed, if necessary, to secure a uniform grade from level to level. The shaft stulls are set and the station finished. The permanent track is put on. And, finally, the lining and manway completed. The drifting and sinking can then be resumed without danger to the station.

THE *American Machinist* notes that Troy, N. Y., is no longer the chief center of production of stoves and steam engines in this country. But while it was once a city of male workers only, it has now so great a collar-and-cuff industry that the balance of occupations for the sexes has been reversed. Our contemporary adds: "We have an impression, at this writing, that Pittsburg, Cleveland and some other manufacturing cities are suitable places for establishing more of the female industries, while the balance in New York City would be promoted by a reversal of the process.

The Calumet & Hecla.

TO THE EDITOR:—With the exception of the Calumet & Hecla Company, the practice of the officials of the several mining companies of withholding from the newspapers the publication of their monthly outputs of mineral copper seems to be for the purpose of permitting the directors and their inside associates to either "bull or bear" the stock market, and, as a well posted newspaper man remarked, "those officials are now making more money in stock gambling than in the legitimate pursuit of their duties which they owe to the shareholders and the public."

In the case of the Quincy, the product being 135 tons less last month was simply due to the fact that the No. 2 shaft house and shaft was in course of reconstruction and could not be used for the hoisting of copper rock. It was the intention to add another week's product to the monthly product and not report a short one, but they changed their minds in consideration that the short product would "bear" the stock and there would be a chance to buy in.

The wire ropes are now all on the new drums at No. 3 shaft Tamarack, and the cages for hoisting rock and the miners have been put on, so that the shaft is now ready to go into active operations next week. The addition of the product from this new shaft will greatly increase the product and will furnish copper from a deeper portion of the earth than has ever been mined. A. F. ISLER.

Houghton, Mich., June 17, '95

DEVELOPMENT of water power has been begun at Minneapolis, Minn. This latest utilization of the powers of nature is to be brought about by the construction of a dam below the falls of St. Anthony, which will husband the energy of the current now running to waste in the rapids. It is calculated that 10,000 horse-power will be added to the industries by the erection of this dam. A canal of sufficient depth to admit of steamboat traffic to the foot of the falls is also included in the improvements. About $1,000,000 is to be expended on the work, which is being carried on by the Pillsbury-Washburn-English syndicate, and the people of Minneapolis and vicinity are congratulating themselves on the facilities which these improvements will afford to the trade and commerce of that section.

AN English publication, *The Iron and Coal Trades Review*, is authority for this statement: "Wagon frames are made in Leeds and Chicago by the same system. In the latter city the workmen get twice the wages paid to their English brethren, and yet such are the facilities for turning out work possessed by the Americans and such is the energy which they display that it is possible to put the Chicago wagon frames on the market cheaper than those made in Leeds."

The Mineral Hydrocarbons.

NUMBER XXIX.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

Merced County.—By newspaper accounts, Merced county was at one time credited with a gas well 650 feet deep. "A large drum serves to collect the gas, which is the only source of light and fuel used on the premises. The daily use of the gas is one of the most attractive features of the colony. * * * The well is near the Crocker & Huffman canal."

Monterey County.—The following are newspaper clippings, September 25, 1889: "While sinking an artesian well at Salinas, on a lot near the courthouse, a vein of natural gas was met with at a depth of eighty-four feet. On applying a lighted match, the flame arose to the height of ten feet. Gas veins have been struck here at different places years ago." * * * "The flow of uatural gas struck here last week shows no sign of abating, and the flame which, when first lighted, rose about six feet high, now rises sixteen feet. It is an immense sheet of flame from a width of eight inches at the mouth of the pipe. It increases to five feet at the top. It will be allowed to burn for some days yet, and then, if it should show no sign of exhaustion, measures will be at once taken to utilize it."

Orange County.—Natural gas occurs in the Santa Ana plains. Two wells have been sunk—one 347 and the other 740 feet deep. As described by Dr. Stephen Bowers, these wells much resemble those at Stockton. The section he gives is much the same. The temperature, the mineral character of the water which flows with the gas, and the physical properties of the gas itself show the conditions to be very similar. Dr. Bowers states that gas was struck near the same locality years ago. Gas escapes in other parts of the county, especially at Newport bay.

Sacramento County.—There is an artesiau well on the Haggin ranch, nine miles northeast of the city of Sacramento, which yields some inflammable gas. The well is said to be 2250 feet deep. In 1889 or 1890 the Sacramento Natural Gas and Water Company was organized to sink for water and gas. With what success I have no certain knowledge, but it would seem that the chances of finding gas in considerable quantity would be as favorable as at Stockton.

San Joaquin County.—At Stockton natural gas has been more exteusively produced and used than at any other locality in the State of California. The gas interest in that city has become a matter of very considerable importance, although the product is small as compared with that of the Eastern States.

The numerous gas wells of Stockton resemble each other so nearly that one is a type of all the others. The manner of sinking the wells, construction of gasometers and connections are much the same iu all; they are simply artesian wells, the overflowing mineral water of which is supersaturated with hydrocarbon gas.

As the water flows over the rim of the exit pipe it has the appearance of being milky. If a glass goblet is filled with it, a clear stratum soon appears near the bottom, which increases until withiu a few moments the apparent turbidity wholly disappears, leaving the glass full of transparent aud colorless water. This whiteness, like that of snow, is due to the presence of minute globules, the former being gas, the latter atmospheric air. Milk under the microscope is seen to be a transparent fluid containing equally transparent fat globules. The effect produced by light is in either case the same; they seem to be white and nearly opaque. At the Jackson well a portion of the gas escapes through a small basin that surrouuds the pipe which termiuates three or four feet above. The contents of the basin are clear, but if they are stirred violently, or if a stone be thrown into the placid water, gas rises for a time, giving the water the same characteristic appearance it presents when flowing from the end of the pipe.

The water and gas, having no affinity, part company as soon as they emerge, not because of any mutual repulsion but by reason of their different specific gravities. The water, by gravity, seeks the earth and a passage toward the center, while the gas, by a different impulse, soars away far above the clouds.

If, after the excess of gas has escaped, some of the water be violently shaken in a bottle, the mouth of which is closed by the hand, a gentle puff of gas results, but with no explosive pressure, as would be the case if some of the carbonated waters of the State were similarly treated; but if the water is allowed to remain uncovered for a few hours no uncombined gas can be discovered by the usual tests employed by chemists.

The water from open wells overflows with great regularity. The gas escapes with a subdued hissing or boiling sound which can be heard at a distance of several feet, but when it escapes under the gasometer the sound assumes a different character, humming like distant machinery in motion.

At the Jackson well I was deceived by a sound which seemed to indicate the escape of the gas in pulsations. In addition to the usual murmur, at the end of nine seconds with great regularity, there was a louder rumble which interested me, for I was aware that the gas and oil in Pennsylvania flows in pulsations; but I found on closer inspection that the sound was due to the intermittent escape of surplus gas under the lower rim of the gasometer, all of which was going to waste, and this, I was informed, amounted to 10,000 cubic feet in 24 hours. Pressure boxes—if I may so call them—are built over each well; they are shallow and not large; the basin which holds the water is circular, and is built of brick laid in and covered with cement; they are from 4 to 8 or 10 feet deep and about 16 feet in diameter. Within this space is the gasometer, which acts as a pressure box and causes the accumulated gas to flow to a more capacious storage gasometer of thick sheet iron galvanized or painted, sometimes both. The tops of these primary iron chambers are flat; an opened yeast powder can turned edge downward in a basin of water would represent one on a small scale. There is no opening on the top, on which half barrels filled with earth or bags of sand are laid. The open end of the well pipe rises in the center of the chamber nearly to the roof; the overflowing water escapes at an opening constructed on the principle of a trap. The water level being thus maintained, the rising gas is soon under pressure and the iron chamber rises in proportion. The weights increase the pressure, which can be regulated by multiplying or diminishing them. An exit pipe also rises from the bottom of the basin, the end being within the chamber and above the surface of the water; if this pipe is open the gas will flow through it under slight pressure to any point required, and is first generally collected in the large storage gasometers mentioned. A five-inch iron pipe had been laid to the city from the Jackson well, but at the time of my visit it was not in use. If the exit pipe is closed, the pressure, increased by the rising gas, soon causes it to escape under the edge of the iron chamber, as in the case mentioned at the Jackson well, for the flow of gas never ceases. All the storage arrangements are constructed on this principle. The large storage and distributing reservoirs or gasometers are built in the following temporary manner:

A circular pit is dug in the earth from 35 to 40 feet deep and the same diameter; a pump is rigged to keep out the water, and is worked by a steam engine, the fuel being gas from a pressure-box near by. The bottom of the pit is leveled and a great redwood tank is built, with tight bottom and sides; the staves are bound together by strong hoops of iron tightened by set screws; the pipes of ingress and egress are brought up through the wooden bottoms and made tight by well-packed flanges; workmen then put together sheets of iron punched for rivets. When these are joined a great hoop of sheet iron forms the lower edge of the gasometer; another and another are added until the chamber is fully constructed. Earth is then filled in aud leveled about the outside of the tank, and a finished gasometer is the result, which is then filled with water and the pipes joined by flanges with the main and with the pipe of the pressure-box, through which the gas flows until the large chamber is full. In some cases more than one of these gasometers are required to take care of all the gas produced by a single well.

The gas at Stockton does not seem to differ from that of the burning spring in Colusa county; it is colorless, transparent, without odor, and burns with a fervid, almost non-luminous, flame; this latter property is a serious defect, which detracts from value of the gas. An attempt has been made to remedy this fault by passing the gas through an atmosphere of naphtha, gasoline, or other light petroleum, but it was neither economical nor effective and was soon abandoned. Special burners are now used; the favorite seems to be the Welsbach incandescent. The Lungren regenerative gas lamp is sometimes used, and is fairly satisfactory. For domestic use the gas seems to give perfect satisfaction, and for that purpose it will, in my opinion, be very largely used in Stockton and elsewhere in the State if the supply continues, which we have good reason to hope and believe it will. For large manufacturing operations it is not so well suited, not, however, for any reason except the comparatively small yield of the wells and deficiency of pressure. Unless the true bedrock should be reached, or different conditions met with, this cannot be expected. I have heard of no instance in which gas was used in a large way that the heat was not assisted by the addition of coal or other fuel. This opinion should not be construed to the discredit of Stockton gas, or the gas wells. If Nature does not supply this convenient fuel in the enormous quantity that she does in Pennsylvania and some other States, it is still in sufficient abundance to be of much practical value. It is a great blessing and should be used to its full capacity for power and heating. The gas was sold at the time of my visit at the rate of one dollar per thousand feet, and at less for quantities. Supplied to small gas engines it is a cheap and very convenient source of power, and affords great facility to small manufacturers. Pure unalloyed blessings are the exception and not the rule. If we cannot equal Eastern gas production, we should at least be thankful for what we have.

(*To be continued.*)

Treatment of the Pyrites Without Roasting.

The St. John d'El Rey mine, in Brazil, paid dividends for nearly one-half a century. The lode matter contained about fifty per cent of pyritic matter, a mixture of magnetic, arsenical and common iron pyrites. They stamped between one and two hundred tons per day. It was reduced to a very fine condition; about ninety per cent passed through a sieve of 10,000 holes to the square inch. The concentration was doue on bullock skins and baize cloth. The gold in the washings from the skins and baize cloth was amalgamated in wooden barrels. The lode matter contained from $6 to $22 per ton, averaging about $11. The loss of gold in concentration was from ten to fifteen per cent, and in the barrel amalgamation from five to ten per cent, according to the richness of the ore.

The tailings were exposed to the action of air and moisture for a long time, whereby a portion of the mineral became oxidized, liberating the gold previously enclosed by the sulphides, which was then treated in the arrastra.

KRUSHITE is the name of a material by which extraordinary results are, it is said, being obtained by stoue workers, is sawing and polishing granite, stone and marble. It consists of minute chilled east metal shot varying in size from mere powder to clover seed size. Blocks of granite are now being sawn with this instead of sand, at the rate of four inches in depth, and hard grit stone at nine in depth an hour, with twelve blades iu the machine. It is superseding diamond saws, aud is claimed to be capable of doing the same amonut of work at one-tenth the cost. It is also being used in sand blast apparatus in place of sand, and in substitution of diamond drills for boring and drilling. It is an interesting fact that in sawing and polishing, one ton of this material is equal to about 300 tons of the sharpest sand. The tiny balls are chilled to intense hardness without being brittle and by striking it on an anvil the latter will be indented. The action of Krushite is to roll between the blocks and the saw blade or "rubber," doing its work by crushing as a wheel glass-cutter does. Consequently it retains its spherical-shape, and cutting or crushing power, and, as it does not indent or become partially embedded in the blade or rubber, as in the case with sand, emery or corrundum it is rolled backwards or forwards, smoothing the surface by crushing the projecting parts of the blocks being sawn or rubbed. The wear aud tear on the blade or rubber is reduced very much, aud it is said the labor and driving power are reduced one-half. It is used exactly in the same way as sand, and no alteration to existing machiuery is necessary.

THE ballasting upon the Southern Pacific roadbed, between San Antonio and El Paso, is laid by hand with cheap Mexican labor in a very artistic manner. The material is broken rocks from the cliffs that inclose the track at intervals nearly all the way, and the edges on both sides, mile after mile, for hundreds of miles, are marked with selected stones, all of a size and placed as regularly as the bricks in a building. They are mostly light gray sandstone, and the track hands have been particular in laying them. When the border stones are laid down properly the ballast can be dumped from the cars as rapidly as need be, but it is always raked off afterward with the greatest care, so that its surface shall be regular and even. This sort of decoration probably would not be encouraged by railway managers where track hands are paid $2 and $2.50 a day, but the "greaser" works for 75 cents and is satisfied.

THE greatest labor union in the world, the British Amalgamated Society of Engineers, reported a membership of 75,510 last year, and an income of $1,306,965. Of this amount, $688,934 was given to members out of work, $201,247 was paid in sick benefits, and the amount devoted to funerals was $54,061. For other benevolent objects the sum of $28,704 was expended, while the item of dispute benefit shows an expenditure of $9,253. The last item shows what was expended on strikes during the year. The average number of unemployed during each month in the year was close upon 7,000 members, all of whom were supported from the funds; the average for the year was equal to 8.4 per cent of the members.

DID you ever stop to think why oil barrels are painted blue? In making the barrels they are thoroughly soaked in water, then they are painted blue, as this is the best pigment which will hold the oil. Then when the cask is full there is oil on the inside and on the outside, with water between them, and the oil won't come through.

THE Naval experts at Washington are discussing the propositiou to place the armor of the new warships higher up than formerly.

THE California State naval reserve has been awarded $3845 out of the Congressional appropriation of $25,000.

Buying and Selling Mines.

TO THE EDITOR:—I observed in the papers last week, as an item of general news and interest to California, that an association of capitalists in New York were about to organize a syndicate for the purpose of disposing of mines in this State, and presumably elsewhere, the idea being, I suppose, that the respectable character of the gentlemen associated would inspire confidence of capitalists in the East and abroad and lead to the disposal of such properties as the association after due investigation can endorse, all of which is theoretically very attractive and reads beautifully. But capitalists cannot understand why the gentlemen of such an association, and of such well-known wealth and shrewdness, do not take some of these attractive things they offer to individual account, the promised returns being as good or better investments for their capital than could he found elsewhere.

I know that will he the first question asked by capitalists. Having made the attempt to carry out this same enterprise some five years ago in New York I was met with the question, "Why do your capitalists let such tempting investments go abroad; they have the money and the experience in mining business?" It was useless to try to explain that there was a limit to their capital and that it was, as a general thing, already invested to the extent of their means. But this would not do. They were too suspicious, and although there were good names and good men at the hack of the enterprise it did not succeed.

What is wanted is a syndicate of capitalists to *buy* mines, not sell. There is more money to he made by that method than in the commissions in selling, aud the plan is simple. Let an association of capitalists he formed on the joint-stock principle, with a capital say of half a million as a beginning, to be called up as may he required.

At the outset iuvite all who have good properties to dispose of to send in plain statements of their mines (not reports), giving location, character of ores and value, as far as can be ascertained, and nature of improvements. When any such description or statement seems sufficiently attractive to justify, the associatiou to send their own experts to give the property a faithful examination and report to the head office. If the property gave evidence of future value, the association to enter into contract with the owner to this effect: The association to put men at work to make further development to an extent warranted by the prospect, and, if ore is found to justify a mill, to erect same—five, ten or twenty stamps, as justified by the result of exploration—and the ore worked under the supervision of the association agent, the proceeds, less expenses, to go to recoup the association for its outlay; thereafter an equal division of profits and property, or the association may purchase the owner's interest at a price agreed upon.

There are hundreds of claims all over the State that show as much promise as did the largest and hest mines we have. They were all mere "prospects" originally, and would have so remained to this day had not their owuers heen fortunate enough to be able to develop them.

There may he failures, and the money speut in development in many instances bring no returns, but then, again, there may he one success that will more than cover the cost of many failures. If one out of five so prove a success it will pay for the failure of the other four, with the prospect of big profit besides.

There are, as I say, hundreds of good prospects owned by men too poor or too lazy to work and develop them (the latter a prevailing cause). Let the capitalist step in and do it, and we shall soon see our gold product doubled.

This is the scheme for this new association to take up, and where there is more money than in a dozen enterprises of the sort uamed. Everybody can *sell* mines, as it requires no capital to do so; but it is the buyers we want and the men to help the miners develop their idle claims, and if it proves good the association will acquire properties cheaply that will enable them to organize mining companies and have such shares to sell as they can conscientiously offer to their friends. MINER.

June 17, 1895.

"IT HAS BEEN DISCOVERED," says the *National Druggist*, "that the famous tree, from the hark of which quinine is obtained, furnishes no quinine except in malarial regions. If a tree is planted in a malarial district, it will produce quinine; if it is planted in a non-malarial district, it will not produce quinine. It is therefore claimed that quinine is a malarial poison, drawn from the soil and stored up by this wonderful tree."

Books Received.

"*Alaska; Its History and Resources; Gold Fields, Routes and Scenery*," by M. W. Bruce, is carefully written, superbly illustrated, and gives considerable authentic information about the resources of the Territory, coupled with a little personal puffery. The ordinary newspaper article contains more of practical value to the miner or prospector than this book. An excellent map of the Territory is annexed. It is published and for sale by Lowman & Hanford, Seattle, Wash.; price, $1.25.

Coast Industrial Notes.

—San Francisco manufactures each year about $150,000,000 worth of goods.

—Over 900 men are now employed at the Mare Island Government navy yard.

—The Risdon Iron Works has put in two new boilers at the Western Sugar Refinery.

—Nevada has 620 persons engaged in manufacturing. Their annual product is $1,105,063.

—Fir, spruce and cedar logs at Grays Harbor, Wash., are quoted at $4.50 per thousand.

—Marysville has voted almost unanimously to issue $40,000 bouds for sewerage purposes.

—The Pacific Rolling Mills are making 4000 tons structural steel for the Parrott building.

—Washington has 20,366 factory hands and annually turns out $41,768,022 worth of products.

—Riverside, Cal., has decided to spend $90,000 for street improvements and electric lights.

—Oregon employs 18,978 hands in her factories and makes annually $41,432,174 worth of goods.

—Idaho has 774 persons engaged in the manufacturing business, the annual output being $1,396,096.

—It is thought that the owners of the Corral Hollow coal mines will build their railroad into Stockton.

—Napa, Cal., invites bids till July 15, '95, for a 50-years' franchise to build and run a street railway in that town.

—The State Labor Commissioner reports that Japanese are working in the country for 50 to 75 cents per day, exclusive of board.

—Leading local cigar manufacturers say that a tobacco crop can he raised in this State and sold to the cigar makers for 25 cents per pound.

—The Comox mine in British Columbia, the only coast rival of the Blue Canyon, is reported sold by the Southern Pacific to the Wellington Coal Company.

—The Southern Pacific Railroad Company will build a three-story depot, hotel, roundhouses, machine shops, coal bunker, etc., at Salinas, which will he the end of the division.

—Exports from San Francisco by sea in May were $2,245,000, against $1,435,600 for May, 1894. Those for the first five months of 1895 were $11,286,000, against $10,235,700 during the same period in 1894.

—The new Mutual Electric Light Co. has a new idea in the matter of redwood conduits for the wires. Francis Smith & Co. are making 300,000 feet of conduit of California redwood dipped in asphaltum.

—It is calculated that every 100 hicycles means a loss of revenue to the street railway companies of $60 a week. If so, in this city, where the hicycles number 10,000, the car companies lose $6000 per week.

—The city Furniture Workers' Union has ordered a strike in the factory of Fink & Schindler, which pays furniture workers $1.50 a day, having decided against permitting its members to work for such wages.

—The S. F. police commissioners have given the Golden Gate Wooleu Mills a contract at $5.50 per yard for sufficient cloth to make 100 police uniforms. The local mills have to thank the Manufacturers' and Producers' Association for this.

—On the 20th inst. ahout $200,000 worth of property belonging to the Seattle, Wash., Street Railway Company was burned. The company's power-house and twenty-five cars were destroyed, and the electric plant almost totally ruined.

—For the first time in its history the Fire Department Committee of this city this week awarded the contract for two years' supply of cotton fire hose to a local rubber company. The hose will be manufactured in this eity, and will be three inches inside diameter.

—J. A. Wilson of this city has leased the Merrimack mill property on the Carson river and put in an extensive plant of stone-cutting machinery to work a large quarry near the mill. It is expected that fifty men will be employed and that the cut stone will find ready sale.

—The Oriental Gas Engine Co. is building two 20 H. P. marine gas engines for the Piper-Aden-Goodall Co. as an auxiliary for the schooner Piute. They will operate twin screws. The company is also filling several orders for small launches and irrigating plants.

—Representatives of twenty-five firms of Tacoma, Portland, Seattle and Mount Vernon, which ship 80 per cent of the shingle output of the Pacific Northwest, met in Seattle last Wednesday and organized the Pacific Lumber and Shingle Association. A constitution and by-laws were adopted and officers elected.

—The Pelton Water Wheel Company have recently shipped a 200-H. P. plant for the South Yuba Canal Company, to operate an electric station at Newcastle. They also have on hand a 500-H. P. plant for the Concheno mine in Mexico, intended for running the mill, hoisting and pumping works of this company, as also an electric light plant for the mill and mine.

—A Nicaragua dispatch states that "the committee of engineers appointed by President Cleveland to examine the plans and route of the Nicaragua canal have been much pleased by what they have heard and seen of the condition of the canal work. The canal line has been cleared between the lake and the western terminus, and the work of clearing the route from Greytown to Ochoa is nearly completed."

—The Minnesota and Arizona Construction Company has organized in Maricopa Co., Arizona, with $50,000 capital, one-half of which has been subscribed. The general intent is to reclaim the Mojave desert. L. B. Palmer, Pasadena, Cal., is secretary. Another corporation—the Arizona Land Co.—has organized in Maricopa county, with a $300,000 capital, to deal in lands, build canals, etc. Walter Bennett, Phœnix, Arizona, is secretary.

—Nelson, B. C., reports that the Kaslo-Slocan railway contractors have a force of 800 men at work and are actively pushing things ahead at several points. The engineers of the Canadian Pacific railway have finished the survey of the extension of the Nakusp & Slocan railway to Sandon, the objective point of both lines. They find that their grade from the present terminus of the line at Three Forks will be over four per cent.

—From 1880 to 1890 valuation of property in California increased 88 per cent. In the same period there was an increase of 49 per cent for the whole United States. The valuation per capita in California increased 35 per cent, as compared with 19 per cent for the whole country. California ranks twenty-second among the States in population, but ranks sixth in total wealth or valuation of property. The tax rate per $100 on total assessed valuation decreased in California from $2.16 in 1880 to $1.70 in 1890; 21 per cent. For the whole United States the tax rate increased from $1.83 to $1.85 in the same period.

—In 1850 the total valuation of California manufactures was $12,862,522; that of the United States $1,019,106,616. In 1880 those of California increased in valuation to $116,218,973, and of the United States to $5,369,579,191. In 1890 the total valuation of California manufactures had increased to $213,403,996, and of the United States to $9,370,167,624. For the period from 1880 to 1890 the increase in the output of manufactures for California was 84 per cent, as compared with 74 per cent for the whole United States.

—It is now proposed to reorganize the Northern Pacific Railroad by replacing all the existing stocks and bonds, aggregating about $245,000,000 nominal value, by $100,000,000 of capital stock and not to exceed $200,000,000 of 4 and 3½ per cent bonds, of which $30,000,000 will he reserved to acquire branch roads and for construction, the Great Northern Railway Company to guarantee the new bonds, principal and interest, and in return to receive one-half of the capital stock of the reorganized Northern Pacific.

—The next Mechanics' Institute Fair, which will open at the Pavilion in this city August 12, the 28th industrial exposition so given will make prominent the matter of home industry. California manufacturers will have opportunity to exhibit the process of production as well as the finished article. There will he eight divisions: Manufactured products — machinery; manufactured products — metals, stone, marble, glass; manufactured products—wood, or wood and iron; manufactured products—animal and vegetable products; electrical, scientific and decorative arts; fine arts; chemical products; natural and food products. There will be forty-six subdivisions. The officers of the Institute well say: "Without the earnest and active co-operation of those engaged in these industries the efforts of the Mechanics' Institute in this direction must avail little. The Board of Trustees therefore strongly urges upon all firms and individuals engaged in mechanical and industrial pursuits to second the effort of the Institute to carry into successful operation this enterprise. No industry is so great that it can profitably ignore public recognition, and none so small that public attention will uot he of benefit to it. Representatives of all industrial and manual trades and handicrafts are invited to exhibit. None will be considered too small or insignificant to be accorded space for its display. No charge of any kind is made for exhibition and power; steam and water are also furnished free."

Girard Water Wheel in Power Development.

The rapid advance made in the development of water power on the Pacific coast has aroused an interest second only to that in mining, and the success which has been attained is rapidly producing its effect, as is shown by the continually increasing number of installations. While plans are constantly being suggested and rapidly adopted for rendering the mountain streams available for power purposes, yet the demand for such power is growing more rapidly than the supply, the consequence of which is that water powers are becoming more valuable as time goes on, and greater refinements are being introduced, particularly in respect to regulation and economy of use. This is notably the case in the operation of improved mining and milling machinery.

Electric machinery requires for its successful aud satisfactory operation accurate and automatic regulation. In the use of dynamos for electric lighting the safety of the lamps can only be secured by a governing apparatus which is quick, sensitive and unfailing. An increase of speed for a very short time may burn out all the lamps on a circuit, and a fluctuating speed, though the changes be small, materially lessens the life of the lamp.

The methods in use, which disregard economy of water and speed control, are no longer permissible, for au electric plant, whether it be for producing light or power, is uot properly operated unless its regulation he equal to that obtained from the hest steam engines; and as water usually has a value, and as its value will he on the increase, there is every reason for making its consumption conform to the work it is doing at any moment.

There is a wide difference hetween the control of steam and water power. Steam being elastic can be throttled without much loss, as it expands and performs work in proportion, but throttling water means a direct and serious loss. The introduction of a butterfly valve or other obstructiou in the supply pipe does regulate speed to some extent, but it is only by reduciug the available pressure. The loss is two-fold, by reason of the decreased pressure, and the fact that the proper relation hetween the spouting velocity of the water and the speed of the wheel is not preserved.

These facts lead to the conclusion that while throttling may operate well in steam engiues, it is not allowable in water-power development. There can be only oue successful method —control of the size of the issuing stream—and this must be done hy a quick-acting hut not over sensitive governor. What is needed is a governor which goes into service on a slight change of load, uot one which depends upon a change of speed.

Centrifugal or ball governors have heen tried in all forms and applied to all kinds of intermediate mechanism; they have been used to direct the power obtained from the wheel through a belt, to control valves operating hydraulic cylinders and to control the ratchet and pawl. None of these have given satisfaction and they are being abandoned very rapidly, in many cases "man regulation," for want of something better, superseding them.

The difficulty lies in the fact that there are too many steps in the mechanism: First, change of speed; second, vertical movement of the balls; third, operation of the governing power, and then time is required for the effect to reach the wheel and alter its speed. All this may *correct* a fault, but cannot *prevent* it.

The Girard Water Wheel Compauy has heen giving especial attention to this subject of water-wheel regulation, and it has perfected and put into practical use, what has been regarded heretnfore as impracticable, an efficient contracting nozzle, operated by a quick-acting and reliable governor.

The latter is so constructed that the entire load passes through it, and by means of a simple arrangement of springs and weights this load is weighed, just as it would he on a pair of scales, and *changes of load* are instantly indicated by the scales. It is not necessary to have a change of speed to set the governor in operatiou, and on this fact rests the secret of its success.

To render it very sensitive the governor is made to do no more work than is required to move a well-fitted and balanced valve, which connects, through large ports, to a hydraulic cylinder, where water under pressure is kept ready to open or close the nozzle. These connections are so close that the nozzle changes before the speed of the wheel can alter.

The Girard wheel can he regulated to any extent for varying quantities of water. This is of great advantage in localities where the supply varies during the year.

There is no change in any of the mechanism to accomplish this result, for as the supply decreases the work done by the wheel is decreased, and the governor automatically closes the nozzle. Thus it may he seen that it is only necessary to keep the work to he done within the limits fixed by the quantity of water.

The construction of these wheels allows a very large volume of water to he applied, while they are well adapted to small quantities, rendering them equally efficient under very high and very low heads. Owing to their practical advantages in these respects, they are very largely used on the continent, and have, to a great extent, superseded all other kinds.

The ability to use large volumes of water makes it possible to employ wheels of comparatively small diameter, and renders possible, in many cases, direct connection hetween the wheel and the machine to be driven, thus avoiding the use of belts and counter-shafts. S. LUCIEN BERRY.

San Francisco, June 19, '95.

Mechanical Progress.

Correct Costs, or the Parallel Column in the Counting-Room.

HENRY HESS, in *Machinery*.

The usual method of determining the cost of product consists in adding actual cost of raw material, actual cost of labor and shop expense. Shop expense is usually determined annually by subtracting from the total expenses of the business the sum of the expenditures for raw material and labor, and dividing the balance by the annual labor cost; the resulting ratio then gives the average relation of labor and shop expense for that year, and is used as a basis for the next year's costs.

COST OF A SMALL MACHINE BY USUAL METHOD AS ABOVE.

Big Shop.		*Little Shop.*	
Raw material	$100.00	Raw material	$100.00
Labor	160.00	Labor	178.00
Shop expense at 125 per cent of labor.	200.00	Shop expense at 50 per cent of labor.	89.00
Total	$460.00	Total	$367.00

Total cost in big and little shop differs by $93, or is about 25 per cent more in the big shop than in the little one; yet for both raw material is the same, while as regards labor the better equipment of the big shop gives it somewhat the advantage. But the little shop can sell at a profit at a price that means apparent loss to its big competitor.

DETERMINATION OF SHOP EXPENSES, USUAL METHOD.

Big Shop.		*Little Shop.*	
Year's cost of raw material	$ 200,000.00	Year's cost of raw material	$ 10,000.00
Year's cost of labor	2,000,000.00	Year's cost of labor	100,000.00
Total	$2,200,000.00	Total	$110,000.00
Grand total of year's exp'es.	$1,700,000.00	Grand total of year's exp'es.	$160,000.00
Shop exp.	4,700,000—2,200,000 = 1.25	Shop ex.	160,000—110,000 = .5
	2,000,000		100,000
	Or 125 per cent of labor. Or 50 per cent of labor cost.		

DETERMINATION OF COST, CORRECT METHOD.

Small Machine.

Big Shop.		*Little Shop.*	
Raw material	$100.00	Raw material	$100.00
Labor	160.00	Labor	178.00
Interest and depreciation of tools actually used on small machine, for time of such use	68.00	Interest and depreciation of tools actually used on small machine, for time of such use	50.00
General expenses	39.00	General expenses	35.00
Total	$367.00	Total	$363.00

Total cost for a big and little shop is substantially the same.

Large Machine.

Big Shop.		*Little Shop.*	
Raw material	$ 3,000.00		
Labor	8,000.00		
Interest and depreciation of tools actually used on large machine, for time of such use	9,000.00	Cannot build it.	
General expenses	1,400.00		
Total	$21,400.00		

From the total year's expenses subtract the sum of the year's costs for raw material, for labor, for interest and depreciation of tools and plant, in so far as they have been charged to individual product. Divide the balance by the total cost of labor plus the above total charge for interest and depreciation of tools and plant, and the result will be the desired ratio. In other words, each tool is to be regarded as a workman having a fixed rate of pay, made up from the cost of power delivered to such tool, the interest on first cost, the depreciation, the interest on cost of plant required to house such tool, and the depreciation of this housing. The interest and depreciation of tool and plant during the time when they are not in use will show up in the general expense ratio, which will therefore be somewhat higher for the large than for the small shop.

For the big shop and small machine the elements of general expense plus actual tool cost will figure out as 66.7 per cent of the labor cost, while for the large machine they increase to 130 per cent. Evidently increasing size of machine increases this ratio; and this is correct, since to build large machines requires a costly outfit of large tools and much real estate to house them and the product. It will not do to strike an annual average ratio, as is usual, because this results in an apparent increase of cost of the small work and an apparent decrease of the large; and it is not true that the ultimate financial result to the shop is the same, as the assumption that the overprofit on the small work pays for the underprofit on the large, for the simple reason that the small work goes to the competitor with the small shop, and apparently lower shop expense.

The correct cost of a given product is the cost of the raw material plus the cost of labor, plus the interest and depreciation of that part of the total plant directly concerned in its production during the actual time of such use, plus a general charge due to those factors of cost which are not directly chargeable to any particular product. In some establishments this general charge will most correctly take the form of a percentage on the labor, plus plant cost, while in others the cost of raw material rather than labor will be used as a basis for this ratio.

Self-hardening Steel.

There is great diversity in the material which is offered as tool steel. Some of it will harden well, and will soften proportionately to the color tests as the hues on the brightened piece magically change with the increment of heat from pale straw to yellow, brown, pink, red, purple, blue, and so on to the greenish blue that precedes the glow of light which marks the departure of the last vestiges of hardening temper. This is the genuine carbon steel. There are, however, says B. F. Spaulding, other kinds of steel which occupy a place which carbon steel will not fill. These are what are known as self-hardening steels.

In doing certain operations with cutting tools on iron and steel, they are not subjected to such excessive strains that heat is necessarily engendered to such a degree that it would soon destroy the efficacy of a tool made of carbon steel. It would produce in it just that degree of softness that would —with the pressure and motion—just fulfill the conditions of cold-welding, and the particles of the substance of the tool would unite with those of the substance acted upon, with the result of tearing away the substance of the point of the tool and destroying its cutting ability.

Self-hardening steel is a kind of steel which is hard when in its normal state, as it cools naturally in the atmosphere. It is not necessary to quench it in water or to cool it rapidly from a red heat in any manner. It becomes soft enough to be shaped into simple forms when red hot. It is of a nature that will not endure a white heat, and it is at a much higher temperature at a white heat than wrought iron is when it is equally luminous. It throws a dark red spark from the emery wheel when there is much carbon in its composition.

The employment of the self-hardening steel is rapidly extending. Wherever it is used it overcomes in a short time the prejudice which its use generally meets. Tool dressers are not favorably disposed towards it at the start, because it is very hard to work into shape upon the anvil and nothing whatever can be done in the way of cutting or bending it when it is cold. After the tool comes back to be dressed over, there is some danger that defects may disclose themselves upon reheating.

Scientific Progress.

Probable Source of Helium.

When chemist Ramsay discovered, in a rare Norwegian mineral a few months ago, the gas helium, which had previously been found only in the sun and a few stars, the natural inference was that this interesting element had probably existed in association with the other materials composing the earth, ever since our globe was first formed, countless millions of years ago. But two hints, coming from different sources recently, suggest another possibility. It is only a few weeks since the *New Science Review* published a paper in which William Crookes, a leading authority in spectroscopy in England, remarked that most of the rarer metals, like erbium and yttrium, were found in the northern hemisphere—a fact which might perhaps indicate, it seemed to him, that they had an extra terrestrial origin—were deposited on the earth, in fact, during a meteoric shower of sufficient length to permit of at least one complete diurnal rotation. And now, in a brief note to M. Berthelot, of the French Academy of Sciences, Professor Ramsay declares that helium has been found in company with a number of rare metals, and has been detected in a specimen of meteoric iron picked up in Augusta county, Va. Probably this last mentioned chemical achievement was one of Ramsay's own. The meteorite, it may be reasonably inferred, belonged to some collection in London to which he had access. Although obtained in a gaseous form, helium (like hydrogen) is technically a metal, and the actual demonstration of its presence in a small body which is actually known to have reached this planet from outer space renders Mr. Crookes' fascinating suggestion the more credible, and admits the likelihood that cleveite, the mineral from which he first isolated the gas, also came from the skies, if not during the present century, at least within a very remote period of the earth's history.

Conjectures of this sort naturally revive the old question as to the unity in character of the materials out of which the planets and stars are made. Less than seventy elements are now recognized in the earth's crust. Only about forty of them have yet been spectroscopically identified with substances found in the sun. If we must reject helium and some others from our comparison, because they have come to us in meteorites, then the relationship between the sun and earth will become less obvious than before, especially when we remember that there are hundreds, even thousands, of lines in the solar spectrum yet unrecognized, and suggesting—we cannot yet say proving—that the great source of light and heat of our planetary system contains a number of elements not existing in the earth. Before the central portion of the great nebulous mass, out of which the sun and planets were formed, had shrunk enough to leave behind in space the independent rings in which the smaller orbs are believed to have had their origin, had the distribution of component elements ceased to be uniform? Did Neptune, Uranus, Saturn, Jupiter, the nameless body of which the asteroids are regarded as the wreckage, Mars, our own globe, Venus and finally Mercury each monopolize certain materials not assigned by gravitation to the others or to the sun? Again, whence come these tiny visitors from space, bearing, if really they do bear, samples of stuff not left in the terrestrial mass at its birth? Some of them, perhaps, have been ejected from the sun during eruptions of almost inconceivable violence; others, certain astronomers think, are the remnants of effete and disintegrated comets which have come from regions lying quite beyond the solar system. The general tendency of all discovery is to show that the whole universe is composed of very much the same matter and governed by the same laws; but there are differences in detail, and possibly we have one of them here.

PROFESSOR BELL believes that telephoning by means of a beam of light will yet be commercially practicable. This belief has grown out of a long course of experiments with selenium, which is marvelously sensitive to the influence of light, when exposed to which it gives vibrations that can be electrically transmitted. Prof. Bell's story of the way in which he became convinced of the possibility of telephoning without wires is interesting. Some years ago he had fixed a thin, highly polished reflector in such a position that it directed the light from a distant schoolhouse roof through the window of his laboratory in Washington, and a friend who was assisting him stood on the schoolhouse roof. As Prof. Bell described it: "A bit of selenium was placed in a test tube and all was in readiness. All of a sudden, as I was listening, out of a sunbeam came these words, "Mr. Bell, Mr. Bell! If you hear what I say come to the window and wave your arms." Prof. Bell considers the success of these experiments as even more wonderful and of greater significance than was the discovery of the telephone, which has become such a marvelous factor, an essential element, in modern business and development.

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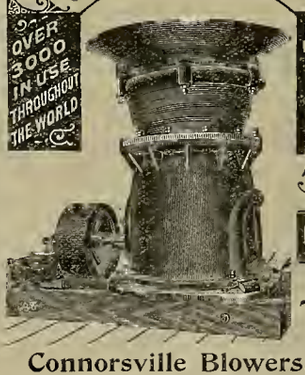

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Electrical Progress.

The Pennock Electric System.*

By J. J. SWANN.

About every so often the newspaper public is startled by reading of some remarkable discovery in electricity which will revolutionize the world. The large majority of such schemes never go farther than a few columns of newspaper talk, after which they die from some more or less good reasou. The Pennock system is an exception to the general rule and in the hands of Mr. George B. Pennock, its inventor, still exists in a very flourishing coudition, if dependence can be placed in the prospectus issued by the company. Generally speaking, it is wisest to pay no attention to revolutionists in electrical as well as in civil life until they reach a certain danger limit. The claims of Mr. Pennock and his associates are, however, so sublime and certain, that they have reached this limit aud cannot be iguored—besides the system brings out several interesting points worthy of notice.

To begin with, if we have a current of sufficient strength to heat the carbon of an incandescent lamp, and reverse it slowly, the carbon is alternately heated and cooled. As the periodicity increases the flickers grow more and more frequeut uutil at about 30 per second, or 1800 per miuute, the flashes blend and the light becomes constant as far as the eye can detect. In practice, about 50 periods per second are used, giving a clear smooth light.

If instead of alternating the current we simply make and break a direct current, the same effects are produced, flashes growing more and more frequent as the speed of the contact-making device is increased, until, at about 2000 per minute, a steady light is produced, which, as far as can be seen, is the same as that of the alternating lamp. An ordinary induction coil with a lamp in series with the primary will show this. And it might be interesting to note that this method can he used to regulate the candle power of lamps; for, hy varying the speed of the contact-maker the light may be varied from nothing to full candle power—the curreut changing in direct proportion to the speed.

The foregoing explanation regarding alternating and pulsating currents will he clearer if we remember that all direct currents are more or less pulsating. Thus we see that lamps can be run in the ordinary way—in series or in multiple—on a pulsating as well as on an alternating current.

It is at this point Mr. Pennock steps in with an instrument or machine he calls a voltage distrihutor. To avoid mistakes the following is quoted from his patent: "The object of my iuveution is to provide a means of distrihuting an electric current from the same source of supply to a number of distinct and independent electric circuits, for the purpose of supplying lamps, motors, etc., with currents of the necessary electromotive force, so that no matter what change is made in one circuit it will have no effect in or on any of the other circuits, and no matter at what potential the current is kept in one circuit, an altogether different potential can he kept iu the other circuits, dependiug altogether on the resistance of each iudividual circuit. I attain my object, first, hy means of a rapidly rotating mechanism, arranged to send a current of electricity through a number of different circuits in rapid succession, combined with any source of electric power, but preferahly with a primary battery or hatteries. * * *

" * * * A rapidly rotated metal arm is arranged to come in contact in rapid succession with a numher of metal disks or segments arranged in a circle on a fire-proof non-metallic plate, such as slate, marble or similar suhstance.

" * * One eud of each circuit is connected to one of the segments, and the other end to a general return wire. The hattery is connected, one pole to the general return wire and the other to the rotating arm. Now, hy rotating the arm very rapidly, a current of electricity is kept flowing through the different circuits without any appreciahle break, and, as the circuits are completely independent of each other, the resistance and current in each circuit can be regulated to suit its individual requirements irrespective of the others; and throwing on or off the lamps in one or more of the circuits will have no effect on the lamps in the remaining circuits. Two thousand interruptions of the current per minute in an incaudescent lamp will deceive the eye into the belief that the light remains stationary—that is, the curreut leaves the lamp for an instant and returns to it again. Thus, so far as the eye can detect or the motor effects inform us, so rapid is the intermittent transference of electrical force that the power may practically he said to be in a hundred places at once, exerting its full capacity."

So far we will allow that nothing particularly remarkahle has heen encountered, although some might dispute several statements just made.

The next step launches us into the supernatural, for Mr. Pennock states that all these lamps conuected to his voltage distributor, whether 10 or 10,000, can be illuminated to full candle power with the current of one lamp. The explanation of this claim is given as follows: As the revolving hrush is in contact with only one segment at a time and we have only one lamp connected with each segment, it is evident that no more current can flow in any one of the circuits than the lamp and circuit resistance will admit. As the arm revolves, circuit after circuit is completed, but no more than one circuit at a time is receiving curreut. Thus we have just as many lamps as segments illuminated with the current of one lamp. In case several lamps in multiple are connected to one segment, the current will be only what one circuit would require. To operate motors, cars, etc., the same device is used, the motor being inserted just as a lamp would be.

In a test of this system made May 4, 1895, in the physical laboratory, Cornell University, the following results were obtained: A circular hrass disk was constructed and sliced into ten segments. An arm provided with a brush was revolved at speeds varying from 0 to 5000. The candle power figures are not absolute, since no photometric measurements were made. In fact, such were unnecessary, for the differences were only too apparent.

Each segment and the arm were conuected with a hinding post for convenience in handling. To start with, one lamp was connected to segment (1)—the circuit being from line through the lamp to (1), thence through arm to the other line, each time it touched on (1) in its revolution. Placing the brush on (1) and starting while the lamp was at full C. P., the instant the hrush left the segment the lamp flashed quite perceptihly uutil a speed of about 1800 was reached, when the carbon assumed a steady glow, though scarcely more than a dull red. Increasing the speed gradually to even 5000 revolutions made no appreciahle difference in the C. P., current readings remaining practically constant. Connecting (1) and (2) so current was flowing for $\frac{2}{10}$ of a revolution, the C. P. increased a small amount but remained constant with varying speeds as hefore. By adding one segment each time and thus allowing currents to flow for $\frac{1}{10}$ of a revolution more for each segment added, the light increased with each addition, remaining constant regardless of speed.

Trying different combinations of segments, such as every other one (1—3—5—7—9), every third one (1—4—7—10), etc., produced no change. The C. P. in each instance depended only on the number of segments connected and not on their relative position.

Connecting one lamp to each segment and repeating, increasing speeds as hefore, each lamp acted as first explained, giving only $\frac{1}{10}$ its C. P., the sum just equaling the light of one lamp. Connecting lamps to two segments, making five in all, each lamp emitted $\frac{2}{10}$ its C. P.—the five giving $\frac{10}{10}$ or equaling one lamp.

No. of lamps.	Ratio of contact.	Equivalent No.
10	$\frac{1}{10}$	1 lamp.
5	$\frac{2}{10}$	1 "
2	$\frac{5}{10}$	1 "
1	$\frac{10}{10}$	1 "

The same will be true of 100 segments, and so on, limited only by mechanical difficulties. In any and all cases the light obtained per lamp varies directly as the ratio $\frac{c}{2\,n}$, where c is the angle through which contact is made. As c increases, the fraction approaches 1 as a limit, or when $c = 2\,n$, $\frac{c}{2\,n} = 1$, or we are getting current for one lamp. As c decreases, the light decreases until $c=0$, when no light is given out. The same holds true in the case of motors or any other electrical machinery.

We now have data for solving the problem. Suppose we take a 50-light machine, 110 volts. Under ordiuary circumstauces this would run fifty 110-volt lamps each giving 16 C. P. This means $.6\times50\times110=3300$ watts and 800 C. P. Let us connect our dynamo to a V. D., and, as has been shown, if we wish to light 100 lamps, each lamp will get one-half its current and give one-half its C. P., or $100\times.3\times110=3300$ watts and $100\times8=800$ C. P., exactly the same, as before. Of course our lamps will burn dimly. If, however, we substitute one hundred 100-volt 10 C. P. lamps we will have 100 lamps burning brightly, but still only 800 C. P. The difference in size between a 10 C. P. and a 16 C. P. lamp is small, so the layman is greatly impressed by the brilliant light.

*From a paper read before the Electrical Society of Cornell University.

It has been asserted in Eastern journals that the Niagara Falls power scheme is a failure, a blunder, a colossal mistake; that the engineers promised more than they could fulfill, and that it is demonstrated in the tunnels the loss of power is so great as to make the electricity cost more in Buffalo than steam. It has been further asserted that only one thing remains to be doue, namely, to build up a big manufacturing city at Niagara Falls, and that the General Electric Co. has been invited to move its entire plant there. The Boston News Bureau claims that the electric generator in the power plant "is doing all and more than it was expected to do," and that the second one will soon be completed. "The Pittsburg Reduction Works, the largest aluminum works in the country, are in readiness to use the power as soon as they receive it, and the Carborundum Works are rapidly approaching completion." The Bureau's informant says: "I shall be disappointed if we don't find the power delivered to manufactories in the very early future, and there is no question in my mind hut the power companies are perfectly satisfied with their investment, and all tests made up to the present time."

The Harrison International Telephone Co., which started out to do so many great things, and which gave such reasonahle prospect of financial success, appears to he iu the vocative. The company makes a very nice report, hut something more substantial has thus far been vainly looked for. The original idea was to ally itself with the Postal Telegraph Co. The Standard Telephone Co., in this regard, seems to have secured that support.

The Leadville, Col., Electric Power and Irrigation Co., proposes to utilize the water power of the Arkansas river to generate 1500 H. P. to supply the mines and smelters in that vicinity with light and power. The estimated cost of the necessary work is $250,000.

The suhurban electric road idea is as awake in Alameda as in other counties of California. The projectors of the Haywards, Mt. Eden & Alvarado road now propose to build to Livermore.

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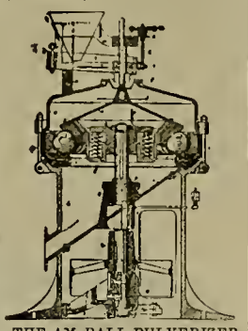

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

Republican: The Argonaut shaft has reached a depth of 750 feet still in slate.

Some of the miners of the Mayflower whose wages are in arrear, have started to work the mine on their own account. Ten stamps of the mill are in operation.

At the Hazard a contract has been let to twelve men to sink a shaft 400 feet, 6x5 in the clear, at $12.50 per foot, contractors to furnish everything except hoisting power and engineer.

Calaveras.

THE GWIN MINE.—Teams are hauling timbers from the Hardenhurgh mine to the Gwin mine, for 50 cents a timber, large and small. The pipe from the mill and mine to the reservoir is taken up, hut the pipe from that up to the ditch remains in place, The reservoir is full of water. Two ten mule teams are hauling the machinery to the lone depot.

The Gwin mine is down over 700 feet in hard hlack slate, Alex. Quarto of Jackson Gate has the contract to mine the crosscut at the 700 foot level west of the lead. They are in fifty feet and a station is there. They have about 100 feet more to go to reach the ledge west of the shaft. Six men are in the crosscut and twelve in the shaft, each working three shifts daily. Sixteen inches of water is all that is used at the Gwin mine.

PASSED BY DEFAULT.—Angels *Herald:* The sixty days option given to Col. Shaughnessy on the Tulloch mine at Alhany Flat, has expired, and the Colonel not coming to the mark with the $50,000 cash the deal has heen declared off.

Humboldt.

GOLDEN PROMISE.—W. L. Loch and W. P. Wilson of San Francisco have filed on seven acres of land above Trinidad in a little natural harhor which runs into the bluff in a V-shape. The property has coarse gravel, and a local paper says contains $10.80 to the ton. The machine to he used to save the gold is an amalgamator, which uses mercury and is operated hy steam power. Between forty and fifty tons of gravel will he handled daily.

Kern.

AMALIE MINING DISTRICT NOTES.—Special Correspondence: Mr. George W. Cline, one of the proprietors of the Picnic mine, is making Los Angeles a visit. He is looking up mining men and mining interests.

The Dull hrothers are taking from their new discovery, the Mayflower, some fine-looking ore showing horn silver.

Mr. J. B. Ferris let a contract to Mr. Z. E. Foster to sink his thirty-foot shaft on the Darling Rosa fifty feet deeper. The work is ahout one-half completed and shows a fine lead. The Darling Rosa joins the Amalie on the southwest and is a promising piece of property.

The milling test made on the ore from the Picnic, as completed, shows up very nicely, running about $40 per ton in gold. This is a recent discovery, with ahout a two-foot lead, and is to say the least a very promising prospect.

Mr. Lanterman, Deputy U. S. Mineralogical Surveyor, has completed the survey of the Amalie mine for a patent and also the preliminary surveys on the Occidental, Darling Rosa, Sauser Extension, Little Jim, Horn Silver, Amalie Extension, St. John and Ferris mines. He has also set mineral monument No. 70 on the summit of the Amalie hill, which formed a hasis for all these surveys, and from which can be obtained a view of the entire surrounding country. The monument is a solid block of granite planted four feet in the mother earth, in the top of which is set a copper plate hearing the monument number and points of compass. G. E. F.

Mono.

THE STANDARD.—*Miner*: The Standard mill has started, having heen shut down to make changes for increase of power to mine hoist, mine pump, and tailing hoist. They have made a ten per cent increase of speed on alternating current generator and motor, now running at 1000 revolutions a minute.

There are two sixteen-inch helts running in tandem from alternating current motor at a speed of ahout 7000 feet per minute, one driving direct current generator for hoists and pumps, and the other driving mill. The alternating current motor was originally self exciting hut is now separately excited, thus doing away with the constant attention required to keep commutator brushes from sparking.

Nevada.

EMPIRE MINE.—*Tidings*: There has heen considerahle improvement in the Empire mine of late and that famous old property is looking hetter now than it has looked for the past year or more. The drift is heing run north in the 2100 level and a raise on the 2000 level is being made to reach the 1800 level. There is a good hody of ore in hoth levels.

Plumas.

SHENANDOAH MINE.—S. K. King, superintendent of the Shenandoah mine, has adopted a different method of working the ore. By means of a furnace, it will first be roasted, then milled and the gold amalgamated last. The furnace is now in course of construction, and other machinery will he shipped as soon as the roads are open via Oroville. With very little repairing, the mill will be ready to run.

QUARTZ MILL PURCHASED.—*National-Bulletin*: B. F. Gullio & Co., has hought of D. McIntyre his ten-stamp quartz mill at Wolf Creek and will immediately move it to the Hibernian mine south of Greenville. They expect to have it in position and ready for milling by the 10th of July. Ahout twenty men are now employed making a road and a foundation for the mill. The roads will he completed this week. Development work in the mine will he resumed immediately. The Hihernian promises to he one of the important mines of that section.

GREEN MOUNTAIN MINE.—T. D. McLeod is pushing the work of investigating the Green Mountain mine. Round Valley ditch water is used to drive the air compressor.

Crosscutting from No. 6 tunnel will develop such veins of ore as may exist there. The main tunnel will he driven ahead toward the Cherokee country. With a sixty-stamp mill supplied with excellent water power, timher handy, and produce purchasahle at very moderate rates, the Greeu Mountain mine can be operated at a profit on ore which, if less favorably situated, could not he made to pay.

El Dorado — Placer.—

THE ZANTGRAF BONDED.—*Republican:* E. W. Chapman has honded the Zantgraf mine, near Rattlesnake Bar. Wm. Graham is surveying a ditch line from Greenwood creek, which, when completed, will he utilized in running the stamp mill and dynamos for electric lighting, pumping, etc. The ditch will run by way of Pilot Hill and will be twenty-five to thirty miles in length, and a pressure of 350 feet will he ohtained. A new twenty stamp mill will he erected and other improvements will he made.

San Bernardino.

OF DOUBTFUL VALUE.—A prospector named Feeny, just in from Indio, tells the Los Angeles *Herald* of the discovery of wonderfully rich placer grounds ahout twelve miles east of the Cargo Muchacho, hy a man named Smith and his partner. They are said to have picked up hy hand $16,000 worth of nuggets in nine days, they having no dry washer and no water to pan with. Feeny says the location is one of the most dangerous on the whole desert, and that it would he suicidal for anyone not familiar with the trail and location to go there without competent Indian guides.

Siskiyou.

GENERAL NOTES.—*Journal*: Williams & Wademan of Yreka, are ahout to put in a concentrator.

Hossick & Brown, of the Eclipse mine, Humbug, are taking out $40 quartz.

At the Benz Bar claim, near Honolulu, on the Klamath, the miners are sinking on the second cut.

Songer & Dame are working the Pacific and McConnell mines at Klamath river day and night.

The Empire quartz mill, on Empire creek, Klamath river, has started up on quartz from a new portion of the ledge, where hut little sulphurets exist to prevent saving the gold, as the quartz contains free gold. After awhile concentrators will be produced to work the wide ledge containing sulphurets.

Shasta.

GENERAL NOTES.—*Searchlight:* The Shasta County Development and Mining Co. are improving their mines on the extension of the Iron mountain ledge which can be tapped at a depth of 1,000 feet from the surface. A recent assay from the ledge showed $56 in gold; sixty-two ounces of silver, and a small percentage of copper.

B. T. Merchant has purchased an interest in the Galena mine, situated in Sugar Pine Gulch, North Cow Creek mining district. This is a smelting proposition carrying gold, silver and lead. The ledge is twelve feet in width, in porphyritic slate, and four feet of mineralized ore on foot wall is exceedingly rich, carrying $187 gold, 40 oz. silver and eighteen per cent lead, which is sufficient to flux the ore. This assay was made by Mr. Rippeto, until recently of the Walker mine. A sample assay made by Julius Siebert, of the Eureka Tellurium, shows gold $7.54, silver 4.28 ozs., and lead sixty-four per cent. R. M. Sealtzer is interested in the mine, and R. Desmond is managing it. The property was located three years ago, but nothing hut the assessment work was done up to the present time. When the Iron mountain people erect their smelter, they can depend on this section for their fluxes.

The Eureka Tellurium is testing machinery, etc. All difficulties have heen surmounted and rock has been put through all processes ready for percipitation.

R. G. Hart, Sr., says the Cleveland Consolidated property has heen honded for $500,000.

THE TRINITY MINE.—At the Trinity mine, on Dog creek, formerly the property of the Trinity Consolidated Gold Mining Company, hut now in the hands of the Bank of Shasta County, who have bonded it for $300,000 for one year to J. W. Frank of Red Bluff, Wm. Fowler has a force of men doing development work.

Sonoma.

A PAYING CINNABAR MINE.—A Healdshurg dispatch says the miners of the Pine Flat district are enthused over striking a paying ledge in the Cinnahar King mine. For five years past work of development has heen carried on at a heavy outlay. Ore running from one to forty per cent has been taken out, hut a ledge now discovered is from six to thirteen feet wide and has heen followed for 112 feet. The ore at the surface will run one per cent and increases in richness as greater depth is reached. A mill and furnaces will prohably will be huilt.

Tuolumne.

THE CONFIDENCE MINE.—*Democrat:* Arrangements are heing made for the resumption of work on the Confidence mine. A. Hamilton, of Baker & Hamilton, is inspecting the property. The Confidence mine was a wonderful gold producer in the early times, and the history of the mine and the character of the ore are such as to convince the owners that it has not been thoroughly worked.

NEVADA.

ON THE COMSTOCK.—The official letter from the Occidental Consolidated mine for the past week says: Five hundred level—The winze from the north drift on this level has been sunk during the week six feet, giving a total depth of 53 feet, continuing in ore of the average assay value of $36 per ton. Five hundred fifty level—The west crosscut on this level is in a distance of 200 feet; advanced during the week ten feet. The face is in porphyry and clay, with hunches of quartz, and shows some value.

The following official reports have been placed on file:

CON. CAL. & VA.—1650 level—On the ninth floor (the first floor above the sill floor of this level) the drift south from the east crosscut from drift south from south end of stope has heen extended 12 feet: total length, 164 feet; face in porphyry and quartz of low value. On twelfth floor the drift south from east crosscut has been extended 20 feet; total length, 195 feet, in porphyry, with some low-grade quartz. On second floor from opening made from drift south from the east crosscut from main north lateral drift on sill floor of this level in working north have extracted seven tons of ore, assaying $60.85 per ton. 1750 level—The opening on the seventh floor above sill floor of this level has heen enlarged to 35 feet in length hy 6 feet iu width, and from this floor have gone upward with an opening 10 feet in length hy 6 feet in width for the eighth floor, carrying ore assaying $25 per ton. Along the west side of the eighth floor have cut into and exposed some timhers of old working. From the second floor up to the eighth floor above the sill floor of this level have extracted 164 tons of ore, making total extraction for week 171 tons, the average assay value of which per mine car samples was $50.33 per ton.

CHOLLAR.—The winze from the 650 level is now down on the slope 33 feet, baving been sunk 19 feet since last report; hottom is low-grade quartz and porphyry. On the sixtb floor of the slope above the 650 level have started a drift which is now out 10 feet in fair-grade ore. On the 550 level we have started a west crosscut 400 feet south of north line, which is now out 15 feet in porphyry. We have started a raise from No. 2 west crosscut on 450 level, 120 feet north of south line, which is now up 25 feet; top shows an 11-inch streak of ore, running from $25 to $35 per ton. During the past week we have extracted and sent to the Nevada mill for reduction 90 tons of ore, the hattery sample of which was $34.56 per ton.

POTOSI.—The east crosscut from the end of the south drift on the 550 level is out 136 feet, having heen extended 12 feet for the week; the face is in porphyry. The raise from the south drift, 550 level, continues to show a streak of ore ten inches wide of fair grade, from $25 to $30 per ton.

HALE AND NORCROSS.—975 level—The south drift from west crosscut 1 was advanced 6 feet; total length, 182 feet. Have stopped work in the face of this drift. Have started east crosscut 2 in our south drift at a point 115 feet south of east crosscut 1 and advanced the same 5 feet; face in porphyry. West crosscut 3, near our northern boundary, has been extended 10 feet; total length, 142 feet; face in porphyry and stringers of quartz. Have done considerahle repairing on this level the past week. Intermediate level—Have advanced south drift 12 feet; total length, 58 feet; face in porphyry and small seams of ore.

CHALLENGE.—The west crosscut from the top of the joint Confidence and Challenge raise from the surface is out 78 feet; the face shows quartz of no value.

CROWN POINT.—From the tenth floor of the raise from No. 1 east crosscut on the 700-foot level they have started a crosscut to the west, which is now out 32 feet; the face is in quartz of no value. During the past week they have extracted from the stopes and shipped to the Mexican mill for reduction 613 tons of ore. The average hattery sample was $10.36, of which $9.24 was gold.

BELCHER.—On the 300-foot level the joint Belcher & Seg. Belcher south drift is in 258 feet from the shaft; the face shows quartz of no value. On the 1000-foot level the northeast crosscut from the north lateral drift is out 90 feet; face is in quartz and porphyry. They have hoisted during the week and stored in the ore-house at the mine 38 tons of ore, the average top car sample of which shows an assay value of $26.46 per ton.

SEG. BELCHER.—On the 200-foot level the southwest crosscut from the south lateral drift is out 96 feet: the face shows porphyry. There have heen hoisted during the week and stored in the ore-house at the mine 16 tons of ore, the average top car samples of which show an assay value of $70.18 per ton.

In most of the other Comstock mines during the week the usual prospecting work was done. No new strikes of ore are reported in the official letters.

WASHOE CO.

AN IMPORTANT INDUSTRY.—*Gazette:* The Reno Borax Company's teams arrived at the Humholdt House recently, loaded with 36,000 pounds of refined horax, from the company's plant near Granite creek, in this county. The company is manufacturing a ton a day now, and has shipped about 200 tons since the works started up. It is a growing and important industry in this county.

LINCOLN COUNTY.

FERGUSON DISTRICT.—Reports from Captain De Lamar's Jim Crow and Monitor properties, in Ferguson district, are that the output of the mill now reaches nearly $100,000 in gold hullion every month. The bullion wagon, with its armed guard, makes regular trips between the camp and Milford, Utah. The new mill is operating smoothly and saves a high per cent of the values. A new and larger water supply will soon be provided. Recent developments have shown up some splendid ore hodies in the mine. The lower development tunnel, which is to he 1,300 feet in leugth, has now reached a depth of 300 feet and is being driven ahead with all possihle speed. When completed this tunnel will serve as an outlet for all ore produced hy the mine.

ARIZONA.

THOMAS MINING CAMP.—Thomas mining camp is sixteen miles south from Blaisdel station on the S. P. railroad, in a spur of the Alvino mountains, Gila range, in Yuma county.

The general formation of the country rock is granite, quartzite and schist and shale capped hy dykes of hull quartz and lime spar. The stratifications run from east to west and the dip is southerly.

The veins are stratified and run with the country rock and dip at an angle of ahout forty-five degrees to the south.

The number of locations made up to the present time are twenty-two, the first and main discovery being known as La Fortuna mine. The shaft is an eight hy six opening and down about twenty-five feet, all in high grade ore and no walls perceptihle as yet. No waste has been taken out and the ore on the dump will be ahout seventy-five tons. A shipment was made to Selhy & Co. at Port Costa and netted about $70 per ton after paying all expenses. The amount shipped was one carload of 102 tons, and the expense amounted to ahout $40 per ton.

BRITISH COLUMBIA.

TRAIL CREEK PROPERTY.—At the North Star after thirty days' work the owners are ready to ship ore, and can turn out twenty tons a day. The ore is said to have assayed $40 to $125.

GENERAL NOTES.—Kamloops *Sentinel:* The Silverine, Caledonia, and Jackpot, Trail creek, have been honded and development work commenced.

The Rossland *Miner* gives the ore shipments for May from Trail creek at 1,923 tons, valued at $92,433.72.

There are 16 feet of ore in the west drift of the Le Roi at the 350-foot level, said to average $165 to the ton.

During May forty-four location records were filed in the Kettle river mining division, four transfers, and nineteen certificates of work.

The reported sale of the Cliff and St. Elmo consolidated claims in Trail creek for $110,000 has not yet been carried through.

THE WAR EAGLE MINING CO.—The War Eagle Mining Company have declared a dividend of $50,000,—ten cents a share.

This is the second dividend. The first was paid March 1 '95, 6½ cents per share, $32,500. The owners figure on paying quarterly dividends of $50,000. The mine is remarkahle in that it has neither machinery nor expensive huildings. It is operated by tunnels into the mountain, and its equipment consists of a rough hoard office, some ore hins, and the tools needed to develop and take out ore. It has no boarding-house, and the men eat and lodge where they please. Compressed air for the drills is had from the Le Roi, hut as the latter mine now has use for all its air, the War Eagle is arranging to put in a twenty-drill compressor of its own.

The War Eagle Company own five claims—the War Eagle, the Iron Mask, the Virginia, the Butte Fraction and the Poorman Fraction. On all of these it has ore, and it is developing them slowly.

A peculiarity of the Trail creek ore is the wide range of values. Ore taken from one vein, and apparently the same, may run $50, $100 or even $150 when assayed, and again it may return only a trace. The only way to get a correct average value is to run a drill across the vein and assay the dust taken from the drill hole. This uncertainty misled many a prospector and mining man in the early days of the camp.

COLORADO.

EXTRACTION WORKS.—Superintendent P. Argall of the Metallic Extraction Works has gone to Denver with a 600-ounce gold ingot, the result of a two-weeks' run of the new cyanide works recently completed at Florence. The result of the refining department of the plant, like all other departments, by this clean-up has proven a complete success. The company has placed an order for two additional crushers for the works, which will double the present crushing capacity.

IDAHO.

"AN ACCIDENT."—Sturgill Bros., on Snake river, while deliherating over the sale of the placer claim for $10,000, had a cave-in on the hanks, and, the Lewiston *Tribune* claims, picked up $14,500 in nuggets hy hand after the accident. This claim is not for sale at present.

UNEXPLORED MINERAL DISTRICTS.—Lewiston *Teller*: There are several unexplored mineral districts in Idaho which are worthy of consideration from the prospector. In Lemhi county, the Salmon mountains, in Idaho and Shoshone counties, the Bitter Root range, with its spurs in Kootenai county, north of the Kootenai river, all afford rich fields for the search of minerals. There are two districts that deserve special mention. These are the Clearwater country, in Idaho and Shoshone counties, of 2500 square miles, and that district in Kootenai county which lies between the Yahk river and the west line, 1300 square miles. Both these districts, while very little known, have heen proven to be mineral-hearing.

MONTANA.

AT ROCKER.—*Inter-Mountain*: H. L. Frank and others of Butte have a promising gold property just across the creek from the town of Rocker, whiob with development work will prohahly prove to he rich in gold. The mine is one known as the old Rooker, from which some $40,000 in gold was taken iu the early days. It was worked at that time with an arrastra and many old miners who worked

about Rocker in the sixties believe that from this rich ledge came much of the placer gold found below Rocker. The present owners jumped the claim last January and started in to thoroughly develop it. After sinking a shaft forty feet they struck the old workings, which necessitated an abandonment on that portion of the mine. Recently a contract was let to sink another shaft 200 feet near the east line. Some of the ore taken out during development work is exceedingly rich, much of it having an assay value of $2,500 to the ton.

OREGON.

THE TOLO MINE.—C. O. White, who put in the Tolo pumping plant, and who has been superintendent of the mine, has gone to Tacoma. N. M. Milner has been appointed in his stead. It is said Mr. White will for an Eastern syndicate put in a pumping plant similar to that at Tolo, in Alaska, for mining purposes.

A BIG NUGGET FIND.—It is reported in Grant's Pass that Eli Taylor recently found on Powell's creek a fourteen-pound nugget in one place, and a thirty-one-pound nugget in another, the two assaying $8500.

BAKER COUNTY.

GENERAL NOTES.—John Longmaid is operating the Eureka and Excelsior mines, forty miles west of Baker City, and keeping a twenty-stamp mill, together with a cyanide plant of twenty-ton capacity, with ore that yields $20 gold at the mill.

The La Bellvue is working with thirty men at Cable Cove on high grade ore, the mill returns showing eighty ounces silver and $20 gold. The property has been purchased by a Cascade syndicate.

The Red Boy at Granite, with a ten-ton Crawford mill, is said to be netting $4000 a month; the Bonanza is yielding $14,000 a month. The Pyx is a new property at Granite, upon the ores of which a thirty-day run was made with very satisfactory results.

The Downey placer in Sumpter valley, is rented to Chinamen, who pay $300 a week for the privilege of sluicing its sands that average seventeen cents a yard. They have made a proposition to the company to lease the bar for six years, agreeing to pay $300 a week during the seven months of the working year.

The Jennings & Kimball placers near Granite are working night and day upon a bar which measures 7,000,000 yards, the average value of which is eighteen cents, and with 2000 miner's inches of water with which to handle the gravel.

UTAH.

THE CYANIDE SUIT.—Producers of gold ores and owners of cyanide plants are interested in the suit of the American Gold and Silver Extraction Company (limited) against the Mercur company, which is using the cyanide process and formerly paid a royalty of $1 per ton. The users of the cyanide process all over the West are not backing the Mercur company in this suit. The only assistance it receives is from the Marion company, which also operates a cyanide plant in the Camp Floyd district.

The contention of the Mercur company is that though the cyanide patent covers a process for the extraction of gold from ores containing base metals, it will not treat such ores. The Mercur people claim that in each case in which the cyanide process was applied to the refractory ores of the Camp Floyd district it proved a failure.

CENTENNIAL-EUREKA.—The Centennial-Eureka last week paid a $30,000 dividend, making a total in dividends to date of $1,140,000. Upon a basis of $1,500,000, it is now paying two per cent per month, or twenty-four per cent per annum, a record that has been kept up for nearly five years, and which, with ore bodies now in sight, should be kept up for an indefinite period.

WASHINGTON.

BONDED FOR $100,000.—A sale of the Ontario and Black Republican mines near Leavenworth is about made. An option on these properties has been secured for sixty days by Puget sound people. The Ontario is the property from which the ore was reported by the Demerside Smelting and Refining Company, of St. Louis, as containing nickel, cobalt and copper, aggregating a value of $149.53. The agreement is that the Puget sound company shall have twenty days in which to make a bond; that the bond shall be for $100,000, $10,000 of which shall be payable in ten days from the date of executing the bond; $10,000 more shall be paid in another sixty days. The balance is to be made in two even payments of $40,000 each in six and twelve months. Mr. Webber of Everett has been negotiating for the Puget sound company and is in Leavenworth looking after the details of the agreement.

COLUMBIA PLACER CLAIMS.—Spokane *Chronicle*: J. W. Young came in this morning from his placer claims on the Columbia river, sixteen miles north of Wilbur, bringing in a lump of gold weighing almost five ounces and valued at $90. He says it is the result of 2½ days' work for five men, averaging a little over $7 per day per man. He says there are about seventy men now working along the Columbia who are making good wages.

THE article on "California Clays—Stove Lining" in the issue of June 15, was written by C. B. Smith, vice-president Asbestos Paraffine Co., 128 and 130 First St., San Francisco, Cal., to whom all inquiries relative thereto should be addressed.

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For the half year ending June 30, 1895, a dividend has been declared at the rate of four and eight-tenths (4 8-10) per cent per annum on Term Deposits, and four (4) per cent per annum on Ordinary Deposits, free of taxes, payable on and after MONDAY, July 1st, 1895.
GEO. TOURNY, Secretary.

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532 California St., cor. Webb.
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Practical Information.

Decline of Natural Gas.

The first rolling mill that used natural gas exclusively was the Etna Iron Works, near Pittsburg, Penn., and the establishment has been one of the last to abandon that fuel in the Pittsburg district. After twenty years of dependence upon natural gas the projectors of this plant have removed the pipes and are now returning to the use of coal, long after most of the other mills had surrendered to the cheap bituminous fuel which has always been the chief foundation of Pittsburg's great industrial prosperity. The diminishing supply and the constant increase in cost have necessitated the abandonment of natural gas by most of the large manufacturing establishments in the Pittsburg district, and its use is being more and more restricted to domestic purposes. Pittsburg has again become the smoky city of fifteen years ago, alleviated in some measure by the use of fuel oil and manufactured gas, which have assumed importance with the decline of natural gas in the last four or five years.

Natural gas was not a factor of very great importance in the Pittsburg district until early in the 80's, and the point of greatest consumption was reached in 1888, after which the decline began. It has never been feasible to ascertain with accuracy the quantity of natural gas consumed each year, but J. D. Weeks, of Pittsburg, has prepared for the United States Geological Survey an estimate of the value of the coal displaced by natural gas, which has been accepted as the most practical measure of the consumption of gas. In the period of its largest use the natural gas consumed in Pennsylvania, measured on this basis, was as follows: 1885, $4,500,000; 1886, $9,000,000; 1887, $13,749,500; 1888, $19,282,375; 1889, $11,593,989; 1890, $9,551,025; 1891, $7,834,016; 1892, $7,376,281; 1893, $6,486,000.

In Ohio the supply of natural gas has fallen even more rapidly that in Pennsylvania. The largest consumption in Ohio was in 1889, when it amounted in value to $5,215,000; but in 1893 it had fallen to $1,510,000. The suddenness of the failure of the supply has caused much inconvenience and loss to manufacturing establishments, which in many instances were deprived of fuel almost without warning. While the supply of natural gas in Pennsylvania and Ohio has been diminishing a new productive region has come into prominence in Indiana, and interest in natural gas is now centered in that State. In 1886 the value of the gas consumed in Indiana was estimated at only $300,000; in 1888 it was figured at $1,320,000, and in 1893 the value was placed at $3,718,000. The opening of this new field has stimulated the development of iron and steel and glass enterprises in Indiana in a marked degree. Notwithstanding the abundance of the present supply in Indiana, there is no assurance of its continuance for a longer period than in other States, and a return to fuels more stable, if less convenient, is merely a question of time. In fact, it is claimed by geologists and gas experts that the point of greatest supply has been reached. While it lasts there is no fuel that possesses so many advantages as natural gas. The uncertainty of its duration is its only disadvantage.

Oil on the Waters.

A simple device for distributing oil on rough water is meeting with adoption among shipowners. The arrangement is practically automatic, taking advantage, as it does, of the rise and fall of the vessel to create an air pressure, by means of which the oil is forced from the reservoir and mixes with the sea. Briefly, a tank is placed in a convenient position at the fore or after end of the vessel, above the water line, and is about three parts filled with oil, the remaining space acting as an air reservoir. In connection with and passing through this tank is a tube, the lower end of which is carried as far down as possible and is open to the sea, the upper part being fitted with an air valve to admit of the air pressed up by the column of water passing into the reservoir. In connection with the main tube an additional air tube is fitted immediately under the water line, which, when the vessel rises, admits air into the main tube, and by means of a valve prevents its escape. This air is acted upon by the column of water, which forces its way up the main tube by the pitching of the vessel, and a pressure of five to six pounds can easily be obtained, which, acting upon the air stored in the reservoir, ejects the oil through the distributing pipes to the sea.

Primitive but Effective.

At Bangalore, in southern Iudia, the quarrying of granite slabs by means of wood fire has been brought to such perfection that an account of the method is interesting. The rock forms solid masses, uninterrupted by cracks, for several hundred feet, and when quarried over an area, says *Nature*, is treated as follows:

"A narrow line of wood fire, perhaps seven feet long, is gradually elongated, and at the same time moved forward over the tolerably even surface of solid rock. The general splitting of the rock is accomplished with light wood, which has been left burning in its position until strokes with a hammer indicate that the rock in front of the fire has become detached from the main mass underneath.

"The burning wood is then pushed forward a few inches and left until the hammer again indicates that the slit has extended. Thus the fire is moved on, and at the same time the length of the line of fire is increased and made to be convex on the side of the fresh rock, the maximum length of the arc amounting to about twenty-five feet. It is only on this advancing line of fire that any heating takes place, the portion which has been traversed being left to itself. This latter portion is covered with the ashes left by the wood and with thin splinters which have been burned off.

These splinters are only of about one-eighth of an inch in thickness and a few inches across. They are quite independent of the general splitting of the rock, which is all the time going on at a depth of about five inches from the surface. The burning lasts eight hours, and the line of fire advances at the average rate of nearly six feet an hour. The area actually passed over by the line of fire is 460 square feet; but as the crack extends about three feet on either side beyond the fire, the area of the entire slab which is set free measures about 740 square feet. All this is done with, maybe, about fifteen hundredweight of wood. Taking the average thickness of the stone at five inches, and its specific gravity at 2.62, the result is thirty pounds of stone quarried with one pound of wood.

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References:
Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
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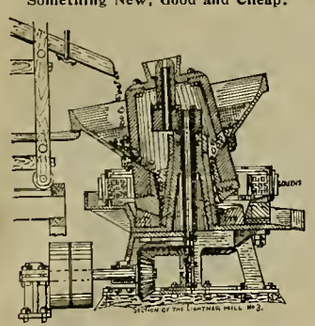
HIGHEST PRICES PAID FOR GOLD, SILVER AND LEAD ORES AND SULPHURETS.

Manufacturers of
BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, ETC., ETC.

Also Manufacturers of
STANDARD SHOT-GUN CARTRIDGES,
Under Chamberlin Patent.

THE LIGHTNER QUARTZ MILL.
Something New, Good and Cheap.



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WM. H. BIRCH & CO.
Also Manufacturers of
Cary Steam Pumps, All kinds of Mining Machinery, Boilers, Engines, Ore Buckets, Ore Cars, Cages, Hoists, etc.
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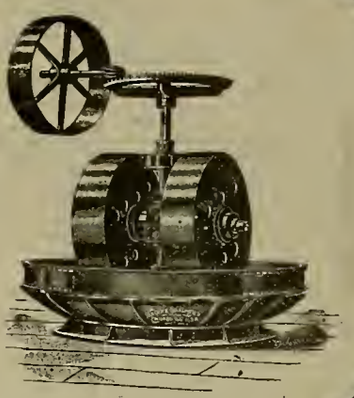
CHICAGO, ILL., U. S. A. and
43 Threadneedle St., E. C., London, Eng.



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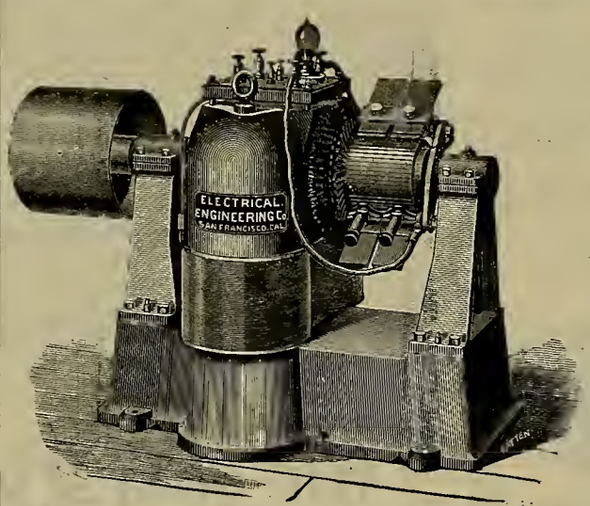
Branch Offices: 2 Wall St., New York; City of Mexico, Mex.; 527 17th St., Denver, Colo.; Helena, Montana; Salt Lake City, Utah.



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FOR THE TRANSMISSION AND DISTRIBUTION OF POWER.
Electric Power Apparatus
FOR
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OFFICE AND WORKS: 34 and 36 Main Street, San Francisco, Cal.

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MINING, MILLING AND SMELTING MACHINERY.
Crushers, Rolls, Jigs, Concentrators,
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Compressors, Hoists, Boilers, Etc., Etc.
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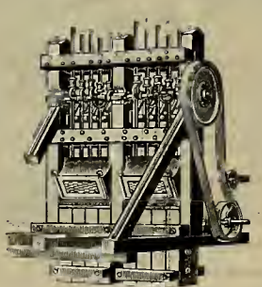
WORK THE BEST, PRICES THE LOWEST.

THE E. P. ALLIS STAMP MILLS,



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Salt Lake City, Utah.....73 So. Main Street.
Denver, Col.....427 Seventeenth Street.
Minneapolis, Minn.....416 Corn Exchange.
Chicago, Ill.....509 Home Ins. Building.
Kansas City, Mo.....43 Armour Building.
Pittsburgh, Pa.....German National Bank Building.
New York City.....26 Cortlandt Street.
City of Mexico.....Calle Gante, No. 12.
WRITE FOR OUR NEW CATALOGUE.

NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES
For Saving Gold
IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.
AT REDUCED PRICES.
Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.
San Francisco Novelty and Plating Works
Incorporated.
SEND FOR CIRCULARS.
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Justinian Caire, Agent
521 and 523 Market Street, San Francisco,
—DEALER IN—
Assayers' and Mining Material.
—MANUFACTURER OF—
BATTERY SCREENS AND WIRE CLOTH.
—AGENT FOR—
Hoskins' Hydro-Carbon Assay Furnaces.

Market Reports.

The Markets.

SAN FRANCISCO, June 20, 1895.

The metal market is strong throughout, there being a general advance. The Illinois Steel Co. report this week a raise of $2 a ton, which they calculate will increase their income $60,000 per month, their monthly output being now 30,000 tons.

The Copper circular of D. Houston & Co. of New York says:

Copper has also awakened from its dormant and lethargic condition, and is in a notably strong position. Since the middle of April the market for this metal has advanced fully 1¼ cents per pound in New York and from £4 to £5 per ton in London. The statistical position of copper, the condition of trade, the relations that the prime factors of supply and demand sustain to each other, are all of such character as to make the outlook very bright and promising. The consensus of opinion of those best qualified to judge is that we are simply on the threshold of a long period of sustained activity and prices, which will gather strength from purely natural and not artificial cause. The present improvement is regarded as simply the beginning of a decided forward movement that will become more pronounced as time progresses.

Negatively, the position of copper is strengthened by the fact that no artificial measures are in operation to inflate the market. An impression that the present advance could only be sustained by some sort of agreement between producers, whereby output and exports would be kept within certain limitations, has carried some weight among a certain class who have only a superficial acquaintance with the real situation. Negotiations between European and American producers, whereby a reduction of 5 to 7½ per cent in the foreign production, with a restriction of American exports to 60,000 tons per annum, formed the basis of agreement, have terminated without any arrangement at all. The Calumet and Hecla and Anaconda companies withheld their consent. It is believed by those high up in copper circles that the position is really stronger without any agreement, otherwise everyhody would be afraid it would break or end; now, however, the situation is entirely natural and sound upon its merits.

Under date of Liverpool, June 4th, James Lewis & Sons, in their monthly report on ores and metals, say, discussing copper: During the past month the speculative market has been subject to somewhat violent fluctuations, under the influence of favorable or unfavorable reports as to the progress of the negotiations to limit European production and American exports of copper, the final conclusion of which is the determination of the Calumet and Hecla Co., of Lake Superior, to decline to he parties to any such agreement, although assented to by all the otber mining companies concerned. Various reasons are assigned for this non-concurrence, that publicly announced being that tbe manager of this company considers any agreement unnecessary in view of the present active demand for copper in the United States, due to the very pronounced revival of trade, and that the desired object will be attained without the use of any artificial means. Definite proof of this improved trade is shown in tbe important advances in wages which are being generally conceded by producers and manufacturers, the Calumet and Hecla Company, amongst others, granting an increase of ten per cent on the wages of 3500 men employed by them. This will represent an increase in the cost of the copper produced by this company of at least £1 per ton, and follows a similar advance granted a few months ago.

It appears that in the month of April, the Calumet and Hecla Co. sold a large quantity, stated to be 12,500 tons of 2000 lbs., of their copper at 9.50 cents per lb. for delivery up to the end of August. The recent, or any further advance, cannot tberefore be of much benefit to them for some time to come.

It is stated by those most competent to judge that the exports of American copper to Europe will probably be less tban 55,000 tons for tbe present year. For the past five months they have been ahout 24,750 tons, against 30,724 tons for the same period last year, and 77,130 tons for the whole of 1894.

Tbere is little doubt that the private stocks of copper in France and Germany are very small, and that the public stocks in England and France will steadily diminish in order to supply the increasing consumptive demand.

English best selected ingots sold up to £48, closing at £47 per ton. For Lake Superior ingots £51 was paid, but the present value in New York of 10.75 cents per lb. (an advance of one cent) is tbe equivalent of about £53 per ton; and of electrolytic copper about £52 5s. per ton, Birmingham terms, little being offered for sale.

New York Metal Market.

NEW YORK, June 20.—PIG IRON—Scotch, 19@20c; American, 12.00@12.50c.

COPPER — Brokers', 10.50c; exchange, 10.65c.

LEAD—Brokers', $3.12½; exchange, $3.25.

TIN—Straits, 13.80@14.00c.

SPELTER—Domestic, $3.65.

New York Silver Prices.

NEW YORK, June 20.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30⅝	66⅞	10 50	.....
Saturday	30½	66¾	10 60	3 12½
Monday	30⅝	66⅝	.....	3 15
Tuesday	30½	66¾	.....	.....
Wednesday	30½	66⅞	10 50	3 12½
Thursday	30⅝	66¾	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum.....7@8
Commercial Loans, prime.....6@8
Call Loans, gilt edged.....7@8
Call Loans, mixed securities.....7@8

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Alpha Con, Nev	14	5c	May 23,	Jun 27, July 18	C E Elliott, 309 Montgomery
Alta M Co, Nev	49	10c	May 6,	Jun 11, July 2	J E Jacobus, 309 Montgomery
Andes S M Co, Nev	41	15c	May 1,	Jun 1, Jun 24	J W Twiggs, 309 Montgomery
Best & Belcher M Co, Nev	58	25c	June 12,	July 18, Aug 10	M Jaffe, 309 Montgomery
Bullion M Co, Nev	45	10c	June 12,	July 17, Aug 7	R R Grayson, 331 Pine
Challenge Con M Co, Nev	19	5c	June 11,	July 16, Aug 6	C L McCoy, Mills Building, City
Chollar M Co, Nev	40	25c	May 14,	Jun 15, July 11	C E Elliott, 309 Montgomery
Gold Bar Cons M Co, Cal	1	2c	May 24,	Jun 29, July 22	E C Godfrey, Crocker Building
Hale and Norcross M Co	107	20c	May 29,	July 3, July 25	A B Thompson, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19,	May 31, July 26	J Henry Smith, 431 California
Justice M Co, Nev	59	10c	May 7,	Jun 11, Jun 28	R E Kelly, 309 Montgomery
Mexican G & S M Co, Nev	52	25c	May 13,	Jun 17, July 10	C E Elliott, 309 Montgomery
Sonora Extended M Co, Cal	2	2½c	June 1,	July 6, July 27	C A Stratton, 213 Jackson
Union Con	51	20c	June 18,	July 19, Aug 15	A P Swain, 309 Montgomery
Yellow Jacket, Nev	59	25c	Apr 15,	May 21, Jun 26	W H Blauvelt, 35 Mills Building

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
North Belle Isle M Co, Nev	J W Pew, 310 Pine	June 26

Mortgages, prime, taxes paid by lender.....6@8
New York Sight Draft.....2½c
New York Telegraphic Transfer.....5c
London Bankers' 60 days.....$4.88½
London Merchants.....$4.86
London Sight Bankers.....$4.89½
Refined Silver, per ounce.....66¾c
Mexican Dollars, nominal.....53½c

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	5½
Powdered, "	—	@	5½
Concentrated, "	—	@	5
COPPER.			
Bolt ¼ & 5-16, 17c; ⅜ and larger, 16c			
Lake Superior Sheathing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
COAL. SPOT FROM YARD—PER TON.			
Wellington	$ 8 00		
Greta	7 75		
Nanaimo	6 50		
Gilman	6 00		
Seattle	7 00		
Coos Bay	5 50		
Cannel	8 00		
Egg, hard	12 50		
Wallsend	7 50		
Scotch Splint	7 50		
Brymbo	7 50		
West Hartley	8 75		
TO ARRIVE—CARGO LOTS.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'	75c	₱	bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —
LUMBER. SAN FRANCISCO — WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00
ZINC.			
Sheet	8¼@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do. "		"	1 45
QUICKSILVER.			
Home trade, per flask	39 00	@	— —

Mining Share Market.

SAN FRANCISCO, June 20, 1895.

The market improved some this week in volume and figure, Comstocks experiencing a general advance.

A special meeting of the Hearst Mining Company has been called for the purpose of deciding and voting upon a proposition to ratify a sale of all its mining claims known as the Alabama, Bailey and Humboldt, upon the Brunswick lode.

Regarding the Brunswick ground, the *Enterprise* says "operations are to commence immediately. Saturday, Superintendents Ryan, Keating, Gorham and Kervin and Engineer Haist spent the day in viewing the ground with a view to deciding upon a plan for immediate action. It is understood that two drifts will he started immediately from the tunnel—one toward the north aud the other toward the south. Fifteen men will be put on in eacb until it is decided to start upraises, when the force will be augmented. When the rich ore is struck, which the Brunswick is almost certain to contain, we shall see a rehabilitation of the old camp."

The following illustrates the changes of the week:

Mines.	13	20
Alpha	$ 02	.....
Alta Consolidated	15	$ 17
Andes	25	26
Belcher	39	39
Best & Belcher	42	47
Bodie	34	35
Bullion	08	11
Challenge	.....	25
Chollar	24	60
Confidence	.....	.....
Consolidated California and Virginia	2 30	2 50
Consolidated New York	.....	.....
Crown Point	.....	37
Exchequer	08	.....
Gould & Curry	29	.....
Hale & Norcross	91	89
Justice	13	.....
Mexican	55	.....
Ophir	1 35	1 45
Overman	16	19
Potosi	47	.....
Savage	35	38
Sierra Nevada	49	64
Union	31	.....
Utah	.....	.....
Yellow Jacket	40	46

San Francisco Stock Board Sales.

SAN FRANCISCO, June 20, 1895.

9:30 A. M. SESSION.

500 Andes	26	100 Hale & Norcross	89
200 Best & Belcher	46	250 Occidental	19
50	47	200 S-B & M	14
200 Bodie	35	1000	13
200 Bulwer	06	450 Sierra Nevada	51
500 Chollar	58	200	52
100 Con Cal & Va	2 40	100 Syndicate	04
100 Crown Point	35		

SECOND SESSION—2:30 P. M.

200 Alta	17	100 Overman	18
100 Belcher	39	1900	19
1000 Bullion	11	50 Occidental	18
50 Con Cal & Va	2 50	600 Sierra Nevada	64
500 Chollar	60	100 Seg Belcher	14
100 Crown Point	37	400 Syndicate	04
300 Challenge	25	300 Savage	38
100 H & N	85	500 Yellow Jacket	45
300 Ophir	1 45	100	46

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Frederick Joubert, in the Joubert mine, near Oak Valley, Yuba Co., to impound tailings in an old pit and behind dams in Willow Creek; from Geo ge Parent, in the Tippecanoe mine, near Camptonville, Yuba Co., to impound tailings behind dams in Spanish Ravine; from W. R. & M. J. Williams, in the Galena Hill mine, near Camptonville, Yuba Co., to impound tailings in an old hydraulic pit; from E. C. Cochran and Charles Turner, in the Atom mine, near Camptonville, Yuba Co., to impound tailings behind dams in Williamson Creek; from William Wellman, in the Young's Hill mine, near Camptonville, Yuba Co., to impound tailings behind dams in a ravine, from M. V. Turner et al, in the Horse Valley mine, at Wood's Point, Yuba Co., to impound tailings behind dams in Horse Valley Creek; from Michael Cortez, in the Sailor Boy mine at Brandy City, Sierra Co., to impound tailings behind the Brandy City Co.'s dam, in an old hydraulic pit; from Fournier & Barrere, in the Charcoal Ranch mine, near Loganville, Sierra Co., to impound tailings behind dams on a flat; from D. O. Keefe, in his mine near Loganville, Sierra Co., to impound tailings in an old hydraulic pit; and from the Plumas Imperial Gold Mining Co., in its mine near Quincy, Plumas Co., to impound tailings behind a dam in Rock Creek, gives notice that a meeting will be held at Room 92, Flood building, San Francisco, Cal., July 8th, 1895, at 1:30 P. M.

WADE & WADE,
Analytical Chemists and Assayers.
109½ Commercial St., Los Angeles, Cal.

RUBBER STAMPS, Type Dates, etc. Catalogue Free. Novelty Stamp Works, Cleveland, Ohio.

Assessment Notices.

GOLD BAR CONSOLIDATED MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, La Porte, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 24th day of May, 1895, an assessment, No. 1, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of June, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 22d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

Office—38 Crocker Building, San Francisco, Cal.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of June, 1895, an assessment, No. 2, of 2½ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the corporation, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of July, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 27th day of July, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

CHALLENGE CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the eleventh day of June, 1895, an assessment (No. 19) of Fi e (5c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the sixteenth day of July, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the sixth day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

C. L. McCOY, Secretary.

Office—Room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the twelfth day of June, 1895, an assessment (No. 45) of Ten (10c) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No. 331 Pine street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the seventeenth day of July, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on WEDNESDAY, the seventh day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office—Room 20, No. 331 Pine St., San Francisco, Cal.

THE JONES ROCK DRILL
IS THE
Only Successful Hand Power Drilling Machine Ever Invented.

It is strong, durable, reliable, simple, compact, light, easily handled and operated by one man, and will reduce the cost of rock drilling at least Fifty per cent.

Our handsomely illustrated pocket catalogue fully explains the features and workings of the drill. It should be in the hands of every mine owner, leaser, contractor and prospector in the West. *Sent free on application.*

If you are interested in Rock Drilling Correspond with us.

WE CAN SAVE YOU MONEY.

FRANK T. SUTHERLAND, M'g'r Pacific Coast Agency.
OFFICE AND WAREROOMS:
Care PARKE & LACY CO.....21 and 23 Fremont Street, San Francisco, Cal.
Or, Address the Company at its Denver Office.

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GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.
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Every description of work plated. Send for Circular.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JUNE 11, 1895.

540,710.—ABDOMINAL SUPPORTER—Kate M. Baltzell, Oakland, Cal.
540,351.—SAWING MACHINE—F. Costa, Carbonado, Wash.
540,724.—INKSTAND COVER—H. J. Cowger, Klag City, Cal.
540,783.—TENTERING FRAME—Caroline N. Eno, Pomona, Cal.
540,857.—CAN OPENER—R. Franken, Pico Heights, Cal.
541,015.—RAIL BRAKE—J. T. Hall, S. F.
540,913.—METALLIC ROOFING—W. Hille, Alameda, Cal.
540,695.—FARE RECEIVER—I. C. Houghton, S. F.
540,696.—COIN ACTUATED LOCK—I. C. Houghton, S. F.
540,864.—SPRINKLER—Frank Lewis, Pleasanton, Cal.
540,839.—BUTTER MOLD—H. S. Maltby, Clarksville, Cal.
541,014.—SPRING BED—B. F. Neely, Colton, Cal.
540,808.—WATER HEATER—A. B. Newkirk, Los Angeles, Cal.
540,844.—FAUCET—A. H. & T. A. Schlueter, Oakland, Cal.
540,764.—ARTIFICIAL LEG—M. Spring, S. F.
541,056.—DISH CLEANER—M. Stone, San Diego, Cal.
540,767.—CAN OPENER, ETC.—Wagniere & Silberstein, Los Angeles, Cal.
540,930.—FINGER RING TWINE CUTTER—Jas. Wallace, Oakland, Cal.
540,772.—PHOTO-TELEGRAPH—C. Willoughly, S. F.
540,773.—FRUIT GRADER, ETC.—L. Wilsey, Arroyo Grande, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

LOCK NUT.—Charles G. Mortensou, Lorin, Cal. No. 540,508. Dated June 4, 1895. This invention relates to improvements in lock nuts. It consists of a polygonal nut having slits cut in one or more of its angles near the inner face, a plate or washer against which the nut is to be screwed, said plate having a convex surface with grooves or channels formed upon each side coincident with the sides of the nut when the latter stands parallel thereto, whereby the tongues or points formed upon the angles of the nuts may be forced into the channels and locked against the shoulders thereof.

STOVE AND KITCHEN UTENSIL.—Frank G. High, San Francisco, Cal. No. 540,548. Dated June 4, 1895. The object of this invention is to provide a device which is variously useful as a stovelid lifter, a lifter for pans or other articles where it can be made to grasp the edge, together with a scraper, a hammer, and means for extracting tacks or nails. It consists of a handle having a curved bifurcated tip at the front, an upward projection formed behind the tip, a wedge-shaped projection from the rear end with a groove or channel extending longitudinally along the lower side of said handle, levers fulcrumed midway of their lengths, one behind the other, within the channel of the handle, having their adjacent ends beveled and overlapping, a curved tip formed upon the front end of the forward lever corresponding in length to the lower portion of the handle tip, and adapted to be closed against it with a spring acting to normally hold the lever away from the handle tip, and leave an opening between the two for grasping articles, a swinging link pivoted to the rearmost end of the handle adapted to swing beneath the end of the rearmost lever so as to close it into the handle and close the jaws or tips at the front end to form a single continuous tip.

EGG CASE.—Moudula Leak and Wm. B. Hayford of San Jose, Cal., and Geo. L. Merguire and Louis D. Radgesky, San Francisco, Cal. No. 540,502. Dated June 4, 1895. This invention relates to an apparatus which is designed for holding eggs, fruit or delicate articles which it is designed to protect from injury during transportation and also a means for turning eggs when the apparatus is used for containing them, so as to prevent the yolks from settling to one side. It consists of an exterior closed case having a hermetically sealed closing door extending longitudinally along one side of the case, of a length approximating to that of the trays, an interior case or frame of approximately square cross section, having a central shaft journaled and turnable with the frame in the outer case, vertical and horizontal cleats or guides within the turnable frame, frames fitted to slide upon said guides and to be held therein, and curved elastic arms fitted in series to the frames to hold eggs or other articles by elastic pressure, so that they may be reversed without falling from the holders.

FUEL-GAS RETORT.—John Martin, Berkeley, Cal. No. 540,505. Dated June 4, 1895. This is a retort for generating what may be termed "fuel gas;" that is to say, a gas resulting from the combustion of fuel when mixed with the proper amount of air and properly generated and mixed in a retort from which it may be conveyed to any suitable point. The object of the invention is to obtain the highest efficiency of coal as a fuel by such a unison of elements therein under combustion, with a proper amount of air, so that the largest or highest number of heat units may result from each pound of fuel. The retort consists of a shell supported upon a closed-in side foundation, and comprising a foraminous bottom, vertical end walls and an arched roof which projects over and beyond the plane of the rear wall of the shell, so as to leave a clear roof space, and the upper portion of the front wall corresponding with the space inclosed by the roof, being provided with openings, a vertically slidable regulating plate controlling said openings, and means whereby the vertical movement of the plate is automatically effected.

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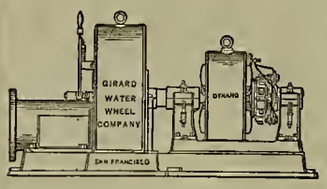

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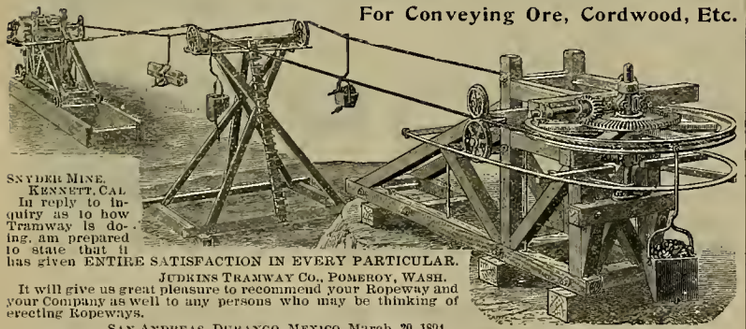

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SAN ANDREAS, DURANGO, MEXICO, March, 20, 1894.
I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation.
ANTONIO H. PAREDES, Director S. A. de la S. M. Co.

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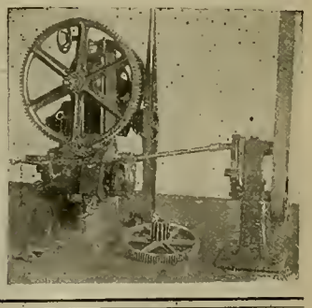

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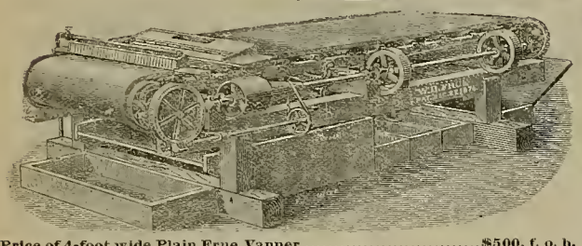

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; March 31, 1891.

Price of 4-foot wide Plain Frue Vanner ..... $500, f. o. b.
" " " Improved Belt Frue Vanner..... 600, f. o. b.
" 6-foot " Plain Belt Frue Vanner..... 600, f. o. b.

—o—

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Jas. S. Brownell,
(Successor to ADAMS & CARTER,)
AGENT FOR THE
FRUE ORE CONCENTRATOR,
132 MARKET ST.,
San Francisco, Cal.

GLADSTONE MINING COMPANY, C. J. Clark, M. E., Gen'l, Supt. FRENCH GULCH, Shasta Co., Cal., Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill.

C. J. CLARK, Gen'l Supt.

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MINING AND MILLING MACHINERY,
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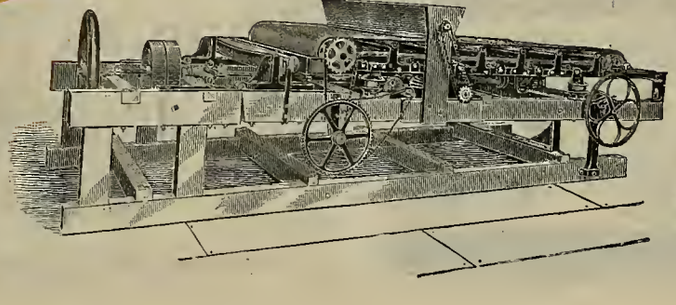
ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness combining both Side and End Motion with a Bumping Belt.

SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1895.

THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works.

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VOLUME LXX. Number 26. SAN FRANCISCO, SATURDAY, JUNE 29, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

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FIG. 1.—INTERIOR VIEW, UNION GAS ENGINE CO.'S WORKS.

FIG. 2.—SANTA MONICA: LENGTH 48 FT., BEAM 12 FT., 20-H. P. UNION ENGINE.

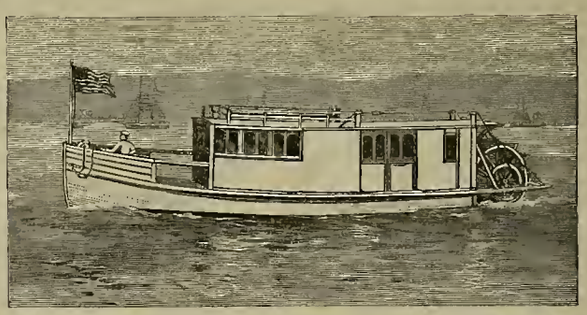

FIG. 4.—RUTH: LIGHT DRAFT, 15-H. P. UNION ENGINE.

FIG. 3.—YOLO BELLE; LENGTH 48 FT., BEAM 10 FT., 20-H. P. UNION ENGINE.

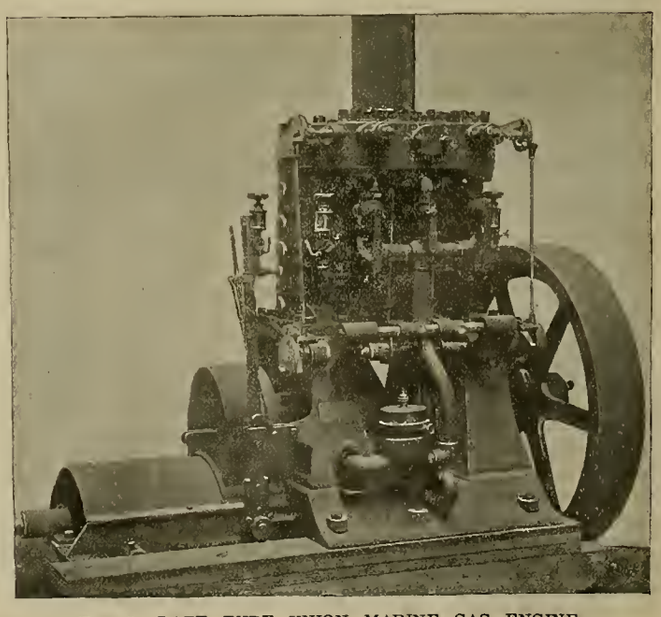

FIG. 5.—LATE TYPE UNION MARINE GAS ENGINE

(See page 410.)

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J. F. HALLORAN.....General Manager

San Francisco, June 29, 1895.

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NEXT Thursday the Ship of State completes her 119th annual voyage, and rounds proudly into port with not a stripe torn nor a star missing. There is some hilge-water in the hold, and some of the machinery is defective; the rigging needs fixing up, and some of the crew are ohstreperous; yet the vessel is sound, and, rightly manned, is good for at least as many more years as have elapsed since the 56 men at Philadelphia gave her her charter papers in 1776.

SOME weeks ago it was stated in these columns that the habit of talking "hard times" (for it is only a hahit) had ceased to he fashionahle iu the East, where people had tired of it as they tire of mauy other things. In the last thirty days Coast residents have also evidently deemed it undesirable and unnecessary to keep on saying times are "hard," and there being an informal agreement to quit so asserting makes it more satisfactory all round. "There is nothing good or bad in life but thinking makes it so," and if we all cease thinking and saying that times are "hard," a great deal will have been done to dissipate distress.

THE Manufacturers' and Producers' Association is doing splendid work. The committee on lumher products need to iuquire into such cases as that of C. A. Hooper & Co., who have ordered 300 M. feet of lumher from Chicago for their new huilding. Another Chicago firm has a contract to furnish 1000 M. feet lumber to the huilders of the new parliament building at Victoria, B. C. This in the face of the fact that in all requiremeuts of size, quality, susceptibility of fine finish, price and everything that goes to make up superiority, this coast can furnish lumber for any purpose better and cheaper than it can be imported.

IN the Witwatersrandt, South Africa, gold mines are employed great numhers of natives at extremely low wages, the miserable shilling a day heiug the basis upon which these properties are made paying or speculative. Partly ou that foundation appears to rest the ability of the Randt mines to keep alive. The sixth annual report of the Witwatersrandt Chamber of Mines, to hand, gives some interesting facts regarding those "miners." The compilers of this report anounce with regret the frightful prevalence of drunkenness, and deplores the great frequency of terrible underground accidents which are rarely reported. Drunken Kaffirs swarm in the mines, incapable of lookiug out for themselves or their companions, and violent crimes, tribal fights and general havoc form a part of the daily doings therein. The white man is blamed for giving whisky to the Kaffir, and warned that self-interest requires a supervision of "the liquor traffic" in that part of South Africa.

WITH universal surprise and regret it is learned that Prof. Geo. Davidson has been removed from his official position. For half a century Prof. Davidson has been prominent as head of the Coast Geodetic Survey, and is recognized in Europe and America as foremost in geodesy, geology and astronomy. Viewed solely from a commercial aspect, aside from his scientific services and attainments, Prof. Davidson has been worth a great deal to this coast and to the nation he so faithfully and efficiently served for fifty years. To give the merest outline of his services and achievements would fill this page. He is now dropped by a Washington official who is either ignorant or careless of the needs of the service, or of the ordinary consideration due to such men as Prof. Davidson. The plea is "economy." Meauwhile the Professor's assistant is given the positiou at the same salary. The PRESS, in common with the thousands who realize his splendid services, feels that injustice has been done. Of him it cannot be said, "Superfluous lags the veteran on the stage." In the zenith of his fame, without one charge ever preferred against him, the acknowledged leading authority in his specialties, with iutellect undimmed and energies unimpaired, Prof. Davidson can get on vastly better without the Government position than the Government can without him. Prominent among the multitude of hlunders the preseut Administration is making, is the retirement of the man who more than any other helped to create the organization that he so worthily headed.

L. RECARD, of Calaveras, has patented and is now having huilt at Altaville a machine which is intended to revolutionize present methods of tunneling. He claims that it will "saw out a tunnel" at the rate of twenty-three feet a day, which, if practicable, will materially reduce the cost of drift work. The suhject is of interest to every miner, and if Mr. Recard can give practical and satisfactory showing of his machine he has as good a thing for himself and the mining world as has been evolved for some time. The machine is described as heing 12 feet long, 4 feet wide and 6 feet high, and with the 14 H. P. engine which runs it, weighs 6300 pounds. The principle is that of a circular saw, 60 drill points attached to each of two wheels, 4 feet high and 8 inches in diameter make 600 revolutions per minute: each point one-half an inch apart, every revolution feeding one-eighth of an inch. The inventor says it will cut twenty feet of a 6x8 tunnel in a day in the hardest rock at the cost of $1 per foot. The machine costs $1000, and requires three men to run it. The rock is crushed as fine as wheat grains, carried to the rear and dumped in a car. The drill points weigh one-quarter of a pound each, last four days, and are kept cool by a steady stream of water. While all things are possible, and it would be unfair aud premature to attempt discussion of a project yet in emhryo, it is to be said that some of the inventor's calculations seem difficult of practical fulfillment.

THE PRESS has had considerahle to say ahout the coming industrial exposition of the Mechanics' Institute of this city, and takes pleasure in further reference to the innovation proposed regarding the manner of judging exhibits and making awards. The method hitherto adopted has heen unsatisfactory iu its practical result. It was evident that if displays for competition and award were to be secured some better scheme of judgment must he assured. The committee in charge have an excellent plan, which, in brief, is to have a standard, represented by 100, each judge, acting independently of the other judges, to indicate his opinion of the exhibit as to efficiency, design, workmanship and display hy marking as near or far from 100 as judgment dictates, the aggregate divided hy the number of judges being the average, and the competitor receiving the highest average to have the award. Competent judges and unprejudiced examiners can, under this plan, with intelligent discrimination, make a just award, which will be more highly valued by its recipient than if assumed to be affected by any element of personal bias. The standard of comparison is to be "the present state-of-the-art, as the judge knows it," and, of course, upon the competency of the judges will depend the justice of the result.

Stamp Mill Methods.

A Colorado contemporary, which usually knows what it is talking ahout, hrings up the old subject of California and Colorado stamp mills, and says it "is proven, or claimed to be proven, that the slow Colorado method will save more of the gold in the ore than the rapid California method," and also says that "the halance of authority seems to he in favor of the claim that the slow method saves the highest percentage of value." It is not "proven" that "the slow Colorado method" is more efficient, nor does any "balance" of competent "authority" favor the Colorado claim. Out of all the discussion that has taken place with more justice could be claimed for the California method all that the Colorado journal credits to the Colorado method; but, even if it were a question of rivalry or competitive merit, it would he invidious to assume that a question is settled because discussed or superiority conceded because claimed. In all the talk about stamps and the relative merits of the California and Colorado mill, it must be remembered that the main question is the release of gold from the ore, and that there are other appliances than stamps. The whole thing is a question of suiting the ore to the process rather than suiting the process to the ore. Following the advice of Paul (not A. B., but his illustrious predecessor the Saint) to prove all things and hold fast to that which is good, the California miner and maker of mining machinery found that, so far as stamp mills are concerned, "the California method" is hest adapted to California ore; probahly the Colorado miner on the same general lines of practical effort may have equally as good an opinion of "the Colorado method" for Colorado ore. Our Colorado contemporary argues further that the higher the grade of the ore the greater the saving in the use of "the Colorado method." This is only a mere assertion, unsupported by statistics or specified instance, and, as such, is unworthy reply. The point is here: Most of our California ore has hut a small proportion of sulphurets—from one-quarter of one to six per cent—these sulphurets being rich in gold. In Colorado, as a rule, the percentage of sulphurets is a great deal higher, and the yield much less. Consequently the two ores require different methods. The old way was to crush coarse in the hattery and grind in the pans. The evolution of the California stamp mill has produced a modern method that gives superior and satisfactory results. It is helieved by many that the Colorado mill sacrifices some of the conditions necessary to the hest crushing in an effort to secure amalgamation, and that the Colorado mill is more of an amalgamating machine. Men whose lives have heen devoted to making or using stamp mills say that the chief requiremeut is to hreak the gangue so that hoth the fine and coarse gold shall come from under the stamps with as little change as possihle in form or condition. Apart from chemical change, there is often considerahle loss from the change in form that the gold undergoes in stamping. Some authorities go so far as to maintain that ore should be cracked, and not crushed, and while this may seem radical to upholders or defenders of "the Colorado method," yet it is not wholly indefensible. As between very coarse and very fine crushing it is believed the advantage lies with the former.

The gold ore of this State, in general, is harder than that in Colorado, the gold therein coarser and the ore hodies larger. Methods therefore vary, and while the California method might produce satisfactory results in Gilpin county, yet it is helieved that a Gilpin county mill would he a failure here judged by financial results. The question is not one of scientific metallurgy, hut money outcome. While the method favored by our Colorado contemporary may produce more hullion at a greater cost, the method most favored here in stamp mill operation produces hullion of greater value at less cost.

There is a contrast and will be, but while we commend the Colorado journal in standing up for Colorado methods which have proved satisfactory in Colorado, we think it should modify its sweeping claims to general superiority, which are unfounded and untenahle.

Concentrates.

THE Centeanial-Eureka (Utau) monthly dividend of $30,000 makes a total of $1,140,000.

A WASHINGTON STATE MINERS' ASSOCIATION is to be organized next week at Spokane.

THE Harqua Hala, Arizona, mine, recently shut down, has resumed work on a small scale.

ARIZONA'S new mining law, a digest of which was recently published, goes into effect next Monday.

THE Banner group of mining claims, adjoining the Gold Cross mine, has been bonded to J. M. Day.

THE Keystone Tunnel and Mining Company of Raton, N. M., has incorporated; capital stock, $1,000,000.

THE De Lamar, Nevada, Gold Mining Co. have their mill running continuously, and ship $30,000 per week.

SUPERINTENDENT WOOD reports that the Camas No. 2, Idaho, mine yielded a net profit of $12,000 in May.

THE Mount Reuben Mining Co. has incorporated in Portland, Or., to operate in Josephine Co.; capital stock $60,000.

THE Omaha Mining Co. has declared a dividend, No. 32, of 15 cents a share, payable immediately in San Francisco.

THE $6 rate on ore from Idaho to Salt Lake has been restored, to the great satisfaction of the Wood River people.

THE American Mining Convention will assemble in Atlanta, Georgia, during the Exposition, on the first week in October.

THE Grass Valley Miners' Union picnic netted $115.50, which has been donated to the California State Miners' Association.

THE Oricut Placer Gold Mining Company of Nevada county has levied an assessment of 50 cents a share, delinquent July 20th.

THE Bullion-Beck and Champion (Utah) Mining Co. last Tuesday declared a dividend aggregating $100,000, payable to-day.

A CONTRACT is to be let to sink a shaft 100 feet and drive a tunnel 100 feet on the Drum Lummon lode on Douglas Island, Alaska.

A REDDING paper says Leivsay and Bystle sold a claim near Shasta to a San Francisco man for $2000. The official record says $360.

AT the Uncle Sam mine, near Kennett, Shasta Co., nearly eighty men are working on rock and shipping about $20,000 per month.

W. J. SCHOFIELD and L. GREEN have bonded the Union Hill, Nevada Co., and will work some of the refractory ore in a Crawford mill.

THE Dayton dredge is finding large quantities of amalgam and sulphurets. It is expected that the company will soon be declaring dividends.

RETURNS from the Black Bear mine indicate that, if continuous, Superintendent of the Mint Daggett will be well up in the financial world.

THE Butte Basin, Amador, Gravel Mine is reported sold in this city, the new owners proposing to tunnel 1000 feet from the Mokelumne river side.

A CLEAN-UP is reported from the Cariboo Hydraulic Company's mine, Cariboo, of 66 pounds 3 ounces of gold, it representing 172 hours' washing.

NEARLY 100 four-horse teams are on the road hauling ore between Rossland and Northport, B. C. There are fully 500 prospectors in the vicinity.

THE *Miner* says: "Bodie is the liveliest mining town on the coast to-day," but as usual in such cases, adds that no one should go there looking for work.

DESPITE the depression in silver, Calico, San Bernardino county, sends out 1000 ounces of silver bullion daily. The Silver King 30-stamp mill is working continuously.

T. J. MCCUNE has a contract to furnish Anaconda, Montana, smelters with 300,000 cords of wood at $3.44 per cord. He has built a 40-mile flume to bring the wood from the east side of the Rockies.

JOHN TIMMINS, editor of the *Searchlight*, a Juneau, Alaska, paper, has been sentenced to six years' imprisonment for attempting to murder Frank Howard, editor of the *Mining Record*, a rival paper.

W. S. BENNETT has refused $100,000 for his Siskiyou Co. placer mine, offered him by a San Franciscan, but is reported to favorably entertain a subsequent offer of $125,000—half cash, the remainder in six months.

THE proprietors of the Golden Cross mine at Ogilby, San Diego county, say they have ore enough in sight to keep a hundred stamps dropping for a year. Nearly 400 M. feet of timber were used in the recent 60-stamp addition to the mill.

THE twelve years litigation over the New Almaden quicksilver mine was ended by Judge McKenna this week who decided against the Gray heirs; that the company's title was good, and that the plaintiffs had no legal claims to the property.

"$27 TO THE CUBIC YARD" is what is now reported from Temple Bar on the Colorado. Forty dry washers are reported about to be put in a mile from the river. As the weather grows cooler these statements will probably contract a little.

THE Sather bank contemplates operating the Stonewall mine, San Diego Co., or disposing of it to an English company. It was recently exported by an Eastern gentleman named Miller, who got $4000 for his report, which is now in London.

R. B. HARPER and Alfred Williams have sold to an English syndicate the Dos Amigo and Eureka mines, Moris district, Chihuahua, Mexico, for a reported sum of £50,000. A 50-stamp mill will be built. R. B. Harper will be manager for the new company.

G. W. ENGLISH, a well-known miner, lost his life at the Calico, San Bernardino, mine last Wednesday. He was trying to clean out a chute which had become gorged with ore, when it burst, covering and smothering him before assistance could be procured.

THE Queen Bee mine, near St. Louis, in Jefferson county, Mont., is sold to Omaha parties for $100,000. The mine has a twenty-four-foot vein of gold quartz, running from $16 to $40 a ton. The sale also includes the Gold Coin, the adjoining claim. A mill will be put up to work the ore from the fifty-foot level up. When the next fifty feet of depth is obtained, a concentrator will be erected.

THE Boundary Creek Mining Company is incorporated in Spokane, Wash., capital stock $1,000,000; to develop the Last Chance mine, Yale district, Boundary Creek. It is a gold and silver proposition and the incorporators are preparing to put in extensive machinery.

ACCORDING to the Sonora *Democrat* the Merced Mining Company of Coulterville has laid off a piece of ground near its properties which is to be sold to married men alone, in ten-dollar assessments. A qualification is marriage. Single men are not entitled to the land at all.

THE new Colorado owners of the Douglas, Brown, Grassi and Pedrassi mines in Silver Star district, Esmeralda Co., Nev.—Senator Wolcott and associates—take possession this week. They are credited with an intention to spend $300,000 in development work and machinery.

MESSRS. Richards and Bragdon tell the Sonora *Democrat* that, at Coulterville, "the Boston and Montana Company will spend one and one-half millions of dollars in development work. The company will, inside of a year, put up a 400-stamp mill." That's a good many stamps!

THE Comet mine, Nevada Co., is bonded to A. W. Stoddart. It has produced some good milling quartz. The lowest depth is two hundred feet. Machinery will be purchased and development work begun. The Gold Flat Mine, near Nevada City, has been bonded to F. C. Beckwith and G. A. Treadwell.

A COLORADO contemporary suggests the formation of an American Society of prospectors. The idea is a good one. It would be somewhat difficult, however, to keep up the honorary membership of the organization, and the real prospector is so eternally on the go that his postoffice address is sometimes a matter of uncertainty.

WHILE recently in San Francisco Allan Smith bought a five-stamp mill, a waster, fans, settlers and other machinery for his Batuc mine, 130 miles northeast of Hermosillo, Sonora, Mexico. He also secured a smelter from the Canizal Mining Co., to run on ore from the Suiqui and Batuc mines. The silver bullion is coined into Mexican dollars.

AT Jerome, Arizona, last Saturday, the premature explosion of a blast in the United Verde Copper Mine tore to pieces a miner named Henry Wilman. He had just finished loading two holes and was preparing to shoot them off. He lighted the first fuse and an explosion followed almost instantly. Defective fuse is believed to have been the cause.

NO SURER indication is observed of the general livening up in mining matters than the appearance of new papers. The Coulterville, Mariposa Co., *Miner* is the latest. Another noticeable feature is the fact that in nearly every case the word "Miner" is chosen as the name of the paper. The only exception in mind at the moment is the *Leader* of Sierra City.

THE Nelson, B. C., *Miner*, a conservative journal, gently raps the knuckles of some of its contemporaries and says "a newspaper in a mining country has no right to make unauthorized statements." Just so. The *Miner* seems to claim the right, however, to reprove its British Columbia rivals for taking matter without credit while constantly doing the same thing itself!

OPERATIONS have practically ceased at the Derbec drift mine, near North Bloomfield, Nevada county, which has been worked continually since 1877. The eight miles of channel averaged 450 feet in width. The ground yield varied from 70 cents to $9, averaging $2.50. The average value of the gold was $18.50 per ounce. For many years the semi-monthly clean-up was over $7,000.

THE big Peralta-Reavis claim to 12,000,000 acres in Arizona and New Mexico has collapsed. Reavis is in prison, and his eminent attorneys, Col. Ingersoll and Col. Broadhead, have abandoned the case. Reavis swore on the witness-stand that the original company organized to push the fraudulent claim had given him $65,000, the S. P. Co. $50,000, and that he had practically blackmailed the Silver King Mining Co. out of $25,000.

THE last monthly report of the Alaska-Treadwell mine on Douglas Island, Alaska, shows 25,991 tons of ore and 398 tons sulphurets worked, the latter yielding $28,873. The total bullion product for the month was $87,697, the expenses were $22,946. The Alaska-Mexican mine close by yielded $17,733 from 233 tons ore and 135 tons sulphurets during the same month, the ore averaging $2.38 per ton. The expenses for the month were $10,485.

THIRTEEN Comstock miners, who left Virginia, Nev., last April to take proffered positions in the Candelaria mine, Durango, Mexico, are returning slowly. They each paid the fare, $43.50, worked a month, got $15 each, found their baggage would be held for their board, and concluded they had enough of it. Their employers' contract to run a tunnel at $8 per foot included powder and fuse and left little for labor.

CONSIDERABLE interest is reported in a discovery on Kosk Creek, 60 miles northeast of Redding. The quartz is reported to carry iron and copper and assay $50 in gold per ton, the outcroppings of the ledge being traced for nearly two miles along the creek. This is the essence of half a column wired from Redding, and is to be taken with a very large grain of salt. It is doubtful if a reliable assay has yet been made and still more doubtful that it will "average" $50.

A RECENT Washington mineral land decision is: "An amended survey and republication will be required where it is found that the land embraced within the application, as set forth in the official survey and published notice, is incorrectly described. Preliminary proof for mineral patent must show the claim valid at application. A mineral notice must give the course and length of a line connecting the claim with a corner of the public surveys with a mineral monument."

THE Pacific Iron Works, in liquidation, is about to foreclose a mortgage of $8695.76 on the Amador Queen Mining Company, in Hunt's gulch, Amador Co., given in 1889 for machinery furnished. A prior lien of miners and mechanics was placed against the property and pressed to a judgment, the property being bought by A. S. Cochrane, of London, England. The company sold and assigned the right of redemption to W. N. Bardue, who subsequently redeemed from Cochrane.

THE following is from the Amador *Republican*: "C. E. Purington is up from San Francisco on the Gover mine business. He has been negotiating the sale of property for some time, and now says positively that the mine is sold. His trip this time is to try and make some arrangements with the numerous creditors, by which the payment of their claims may be deferred. In other words, the proposition is to pay them out of the proceeds of the mine, instead of out of the pockets of the purchasers."

BIG gold nugget finds are so scarce that an Arizona genius deems the time propitious to wire from Hackberry a circumstantial statement of the discovery of a silver nugget, or, rather, a boulder which "weighs about half a ton." He says it was found by W. Tucker and J. Doyle, June 15, 300 feet from the railroad track, four miles from Pench Springs, and is worth from $8,000 to $10,000. The finders are naturally alleged to have located a mining claim where the boulder was found, "to search for the main vein."

JUDGE JENKINS has authorized the Northern Pacific receivers to enter into a contract with the Parrott Silver & Copper Mining Company, whereby the mining company is to build four miles of track at a cost of $63,000, from White Hall, in Montana. The mining company is to erect a smelter and agrees to furnished all the money to build the track, but the receivers are expected to pay it back. This is done by allowing the mining company fifty per cent of the freight charges on material to the smelter on account, and fifty per cent on ore hauled until the amount is paid up.

A DISPATCH from Wardner Idaho, reports great rejoicing over the resumption of work in the Bunker Hill and Sullivan mill and mines. Manager Bradley has put sixty-three men at work, and has applications for work from fifty more. When the properties are in full blast they will give direct employment to 350 men; indirectly, to fifty more. Work was started without a sign of trouble from the Miners' Union. There was no interference of any kind, and no attempt even was made at moral suasion. The feeling in that section is that everything depends upon the action of the union. If the union does not interfere forcibly there will be no trouble; if it does, there is a probability of warfare.

THE Horsefly Gold Mining Company on the Horsefly River, Cariboo, B. C., a distinct concern from the Horsefly Hydraulic Mining Company, has received 250 tons of pipe from this city to use on its 360 acres of placer ground. Its claim is 2640x5940 feet with an average depth of over 50 feet, located on an ancient channel. Thirty shafts have been put down to bedrock from 30 to 150 feet in depth, and numerous tunnels and crosscuts run in different directions to prospect the ground, in all of which gold is found in paying quantities. The company, which is incorporated under the laws of this State with one million dollars capital, proposes to bring in 2000 inches of water through a ditch and pipe line six miles in length. Over $100,000 has been expended in sinking, prospecting, etc.

T. H. LEGGETT, president and general manager of the Bodie Standard Mining Company, who has resigned to accept the position of consulting expert in Johannesburg, South Africa, for a London mining corporation, will leave about the 15th prox. His successor is R. G. Brown, who has been for the past five years in charge of the Clark group of mines at Butte, Montana. It is with considerable regret, says the *Miner*, that the people of Bodie have to see such a progressive and enterprising man as Mr. Leggett take his departure. He introduced a system of electrical transmission of power and of the utilization of tailings which has given a new lease of life to that place, and shown that under proper management the mines can be made to pay.

TWO REQUESTS are received for gold statistics from Mashonaland, South Africa. The British South Africa Company has sent a most elaborate report, but no aggregate is given of the output. In the six districts of Mashonaland, from the inception of mining operations to Aug. 31st, '94, there were registered 44,325 claims. Of these, to that date, 13,880 had been abandoned and 8,076 forfeited. In his report on that country last November, Mr. Hammond says millions of pounds sterling worth of gold have been taken from the ancient mines there, and "considers the prospects of the country encouraging." It is 1690 miles from Cape Town to Salisbury, and the report says, "Parties not pressed for time, who have much baggage, will find it considerably cheaper to travel by ox-waggon."

THE Debris Commission desires it distinctly understood that the provisions under which it operates are mandatory. This will receive the indorsement of every hydraulic miner who realizes how much the industry depends upon compliance with the provisions of the law under which operations are carried on. The Commission announces its intention to prosecute in the Federal courts in such cases as that of L. V. Teft, of Plumas Co., who is alleged to have disregarded the instructions of the Commission and operated his mine in violation of such official instructions. The maximum penalty in such cases is $5000 fine, or one year's imprisonment, or both. The justice or equity of all this is not under present consideration. It is the law and the Commission that has authority in the matter say the law must be observed, and those violating it will be prosecuted in the Federal courts.

S. C. SMITH, who is managing a mining property in the Philippine Islands, lying at the east of the China sea, between Borneo and Formosa, writes from Largos: "As a mining country I have never seen its equal, there is gold everywhere. The little streams are full of placer gold and the mountains a perfect network of small ledges, some of them running as much as from four to six ounces per ton, but the people are at least one thousand years behind the times; no work has yet been done here in a systematic manner, and for several reasons it is almost impossible to prospect here. The government does not give the proper protection to justify any man spending his time prospecting. Another reason is the interior of the islands, which in my opinion is the richest portion of them, are peopled with wild tribes of Indians that are about as ferocious as wild beasts, and no prospecting could be done in their territory, unless the prospectors went in in large parties; and another reason is that the foliage, which is a regular jungle, is so thick that a man cannot get through it. If any other nation on earth, except the Spaniards, had this country, it would very soon be the largest gold producing country in the world, but everything is so handicapped that it is impossible to get capital to come in here and it will take capital to make a success of it. The ore is all high grade but I am a little afraid it cannot all be successfully worked by the free milling process. I have all the machinery on hand for a ten-stamp mill, and if it is a success the company will at once increase their works. They have any amount of ore, and in this country of cheap labor they are bound to receive large profits."

The Lixiviation of Silver Ores by the Russell Process at Aspen, Colorado.*

By WILLARD S. MORSE, Prescott, Arizona.

The purpose of this paper is to record the results obtained in the use of the Russell process at Aspen, Colo., covering a period of fourteen months, from November, 1891, to December, 1892, during which time over 30,000 tons of ore, purchased outright, on sample and assay, were treated. No explanatiou of results will he attempted, nor will the chemistry of the process be discussed.

The plant was designed by C. A. Stetefeldt, of San Francisco, and built by the owners hy day labor. The entire plant is run by water power, supplied hy a flume 3600 feet long, and a pipe line 2200 feet long, with a head of 170 feet. A Peltou water wheel, eight feet in diameter, is used, from which power is transmitted hy wire rope to the main counter-shaft in the mill, a distance of about 250 feet. From the mill to the sampling works, about 150 feet, power is also transmitted by a wire rope.

A Pelton water wheel, three feet in diameter, supplies power to the dynamo for lighting the plant.

The works are located adjoining the Santa Fe railroad tracks, and all ore and supplies are unloaded directly from the cars to the works.

The sampling works are provided with crushers and rolls, the latter being used only on samples, and not on the entire ore. The Cornish hand-quartering method is used in sampling ore for purchase. After crushing and sampling, the ore goes to the bedding-floor, where it is made up into mixtures suitable for the mill.

The drying plant consists of four Stetefeldt douhle shelf-dryers, six shelves high, and provided with dust-chambers and a stack 65 feet high for draft. These dryers are fired with gas from Taylor gas-producers, a description of which, together with the results obtained, was given in a paper by the writer, read at the Montreal meeting, February, 1893, and to which reference is made for details omitted in this paper.

The crushing plant consists of thirty 850-pound stamps, dropping ninety-two times per minute, with douhle discharge mortars for crushing ore, and ten 650-pound stamps for crushing salt.

The chloridizing roasting is done in a Stetefeldt furnace, provided with very complete dust chambers, and a stack 165 feet high for draft. The furnace is likewise fired with producer-gas, and the results will be found in the paper referred to above.

A cooling floor, 100 hy 125 feet, is used for cooling the ore after roasting.

The leaching department is provided with seven leaching or ore tanks, 17 feet inside diameter and 9 feet deep; six precipitating tanks for solution, 12 feet in diameter and 9 feet deep; six precipitatiug tanks for wash-water, 8 feet in diameter and 10 feet deep; four storage tanks for solution, 12 feet in diameter and 8 feet deep; and two tanks for the storage of sulphides, 10 feet in diameter and 3 feet deep.

A Johnson filter-press, operated hy compressed air, and a steam dryer, are used for pressing and drying sulphides.

Two Knowles air compressors furnish compressed air for elevating solutions, stirring solutions during precipitation, and pressing sulphides.

Two boilers, 54 inches by 14 feet, supply steam for heating the mill and solutions, and for drying sulphides.

The following is an explanation of the terms used in this paper:

"Battery sample"—the sample of ore after crushing, taken every half hour and assayed daily.

"Top sample"—the sample of ore and salt mixed, taken every half hour at the top of the furnace, and assayed daily and solubility determined.

"Furnace sample"—the samples of roasted ore taken as the ore is drawn from the furnace, and taken from the shaft of the furnace, the return flue, and the dust chambers.

"Charge sample"—the sample of roasted ore takeu when the ore is charged to the leaching tanks.

"Washed ore sample"—the sample taken from the leaching-tanks after the ore has heen leached with water and the soluhle salts have been removed.

"Chlorination"—the amount or percentage of silver that can be extracted in the laboratory by leaching with hyposulphite of soda.

"Extraction"—the amount or percentage of silver that can he extracted in the lahoratory by the Russell process.

"Solubility"—the percentage of soluble salts that can be removed in the laboratory hy leaching with water.

"Ordinary solution"—a solution of ahout two per cent of hyposulphite of soda.

"Extra solution"—the cuprous hyposulphite of the Russell process.

ORES TREATED.

The ores treated were principally from the Aspen district, and the following is the average composition, calculated from analyses made on each of nearly one thousand lots of ore:

	Ounces per ton.
Silver	27.918
	Per cent.
Lead	2.277
Silica	21.663
Barite	20.924
Lime	10.992
Magnesia	4.245
Iron	10.025
Zinc	2.854
Copper	0.161
Sulphur	8.105

The extremes of each are given below, from the analyses on lots of ore of about 30 tons each. The maximum for each is printed in heavy type, and the other figures in the same horizontal lines show the percentage of the other ingredients accompanying the said maximum.

The total ore treated during the period was 30,856.9445 tons (dry), assaying 27.9188 ounces of silver per ton and containing 861,488.05 ounces of silver. The value was ascertained hy sampling and assaying, and was the amount paid for. It was checked hy battery weights and daily samples, which showed an average of 27.9806 ounces of silver per ton; also by hattery weights and calculated value of top samples made daily, which showed an average of 27.9 ounces of silver per ton.

Extreme of	Ph.	SiO_2.	$BaSO_4$.	CaO.	MgO.	Fe.	Zn.	Cu.	S, as Sulphide
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Lead	**10.5**	15.0	35.0	6.6	1.2	13.2	1.8	.....	0.3
Silica	.....	**90.4**	.....	.....	.....	2.5	2.2	.....	3.0
Baryta	1.1	3.8	**76.4**	5.6	1.6	1.3	1.3	.....	.....
Lime	5.0	3.0	.....	**40.0**	7.5	2.2	1.0	.....	.....
Magnesia	1.3	12.0	4.0	24.3	**15.0**	3.2	1.8	.....	.....
Iron	0.5	3.0	.....	.....	.....	**44.6**	2.9	.....	45.1
Zinc	4.0	7.6	.....	.....	.....	26.8	**15.8**	.....	31.3
Copper	2.5	15.0	.....	.....	.....	34.9	5.2	**4.7**	36.9

Of the 30,857 tous treated, 19,191 tons were sampled by the Taylor & Brunton sampling works, using Brunton's patent automatic sampler, which "checked" with the mill-sampling hy hand-quartering within 0.12 ounce of silver per ton.

DUST LOSS AND LOSS BY VOLATILIZATION IN ROASTING.

	Tons.	*Silver Assay. Value per ton.*	*Total Contents of Silver, Ounces.*
Raw ore	30,857	27.9188	861,488.05
Roasted ore	31,775	24.6289	782,586 09
Loss of silver in ounces			78,901.96

Or 9.157 per cent of the total contents.

The ahove loss iucludes mechanical or dust loss in sampling, drying, crushing, roasting, handling on cooling floor and charging to leaching vats. Just what proportion of this loss is chargeable to these causes it is hard to determine, hut I question if it exceeds 1 per cent. The mill is provided with every appliance for preventing loss from these sources. The dust loss in drying is reduced to a minimum by the use of shelf dryers; the hatteries are provided with a suction fan which forces the dust into a settling chamber, and the dust chambers of the Stetefeldt furnace seem to do the work for which they were designed, as the last compartment contained more fume than dust. It is possible that I underestimate the dust loss, hut I think not, when the fact is taken into consideration that samples of dust, taken at various times from the timbers of the mill, never exceeded two-thirds of the assay value of the ore, and the dust caught in the dust chambers of the Stetefeldt furnace showed an average assay value of 18 ounces, against the average of 27 ounces of silver per ton from the shaft of the furnace.

I presume my figures will be criticized hy Mr. Stetefeldt, who, I believe, has always claimed that the loss of silver hy volatilization in roasting in the Stetefeldt furnace must necessarily be low, on account of the short exposure of the ore to a high heat; hut I have never seen any figures from actual experience to prove this assertion.

Great care was taken to find out exactly what this loss was. For ahout three-quarters of the time every pound of the roasted ore was weighed while heing charged to the leaching tanks, and during the rest of the time the weight of the roasted ore was estimated hy volume, based on the experience gained by actual weighing. The results checked closely with the period when the ore was actually weighed. A further confirmation of the correctness of the figures given is found in the results of a later run of about 8000 tons of ore, where all the roasted ore was weighed, and the loss showed over 10 per cent.

ROASTING AND CHLORIDIZING.

The ore was roasted with 12.2 per cent of its weight of salt, or 244.4 pounds per ton of ore.

Furnace-Samples.—Two daily determinatious were made hy taking a sample from each car of roasted ore as drawn from the shaft, return flue and dust chambers of the Stetefeldt furnace. The proportion of ore taken from each was noted, and assay, solubility, chlorination and extraction tests were made on each sample. Again, when the ore was charged into the leaching vats another sample was taken, and the same determinations were made, and the increase in chlorination and extraction by lying on the cooling floor was calculated.

From the data thus obtained the following averages have been calculated:

	Results when Drawn from Furnace.				
	Proportion of entire ore, per cent.	Ounces silver per ton.	Solubility, per cent.	Chlorination, per cent.	Extraction, per cent.
Shaft of furnace	53.1314	27.7783	15.4524	43.5355	70.4077
Return flue	33.0409	25.0434	10.3801	59.1006	83.8121
Dust chamher	13.8247	18.3307	17.2105	64.1864	69.8810
General average	100.	25.4478	13.5072	52.5102	78.4358

After lyiug on the cooling floor for an average of 102 hours, the ore showed the following results:

Ounces silver per ton.	Solubility. *Per cent.*	Chlorination. *Per cent.*	Extraction. *Per cent.*
24.6289	14.0830	78.9882	89.7857

Differeuce in results hy laying on cooling floor:

	Per cent.
Gain in chlorination	26.4180
Gain in extraction	11.3499

LEACHING OF ORE AND EXTRACTION IN MILL.

The weight of the roasted ore treated was 31,775.338 tons, which was leached in 546 charges, averaging 58.19 tons. Each charge required about 22.5 cubic feet of water, or ahout 60 inches in depth in the tank, to completely saturate it. After washing and removing soluable salts, ahout 50 inches of solution will saturate the charge.

The following method of leaching was followed, as a rule:

1. The ore was charged into one volume of water, followed hy a second volume of wash-water, and by:
2. Three volumes of warm ordinary solution (about 1.8 per cent of hydrosulphite);
3. One volume of extra-solution (average ahout 0.5 per cent of $CuSO_4$);
4. One volume of warm ordinary solution;
5. One volume of extra-solution;
6. Two volumes of warm ordinary solution; and
7. The last wash-water, the dividing liue between solution and wash-water heing drawn wheu ahout one and one-fourth volumes of wash-water had heeu applied.

This treatment was varied as to quantity of solution applied and strength of extra solution, but the ahove is ahout an average. The averagc time of leachiug each charge was about 100 hours. This includes stops of every kind.

The average leaching rate was thirteen inches per hour. This was the natural leaching ratc; hut, as a rule, iu leaching after the ore had been washed, the leaching rate was cut down to ten inches per hour.

The following method of sampling the ore in the vats was used for all samples except the final tailings sample. A brass tube with a valve in the hottom was used, and three to five cores one and one-fourth inches in diameter for the entire depth of the charge were secured. For the final tailings sample the following method was used: After one-half of the charge had been sluiced, and a face of tailings ahout seven feet high and seventeen feet across thus secured, three samples were taken as follows: Top sample, taken ahout one foot from surface of ore and across entire face; bottom sample, taken in same way ahout oue foot from the bottom of the vat; and general sample, taken over the entire face and representing a general average of the tailings.

In addition to the intermediate samples, the following samples were always taken: Washed ore sample, taken after washing ore with water, on which chlorination and extractiou tests were made, as well as assay; first ordinary sample, taken after the ore had heen leached with ordinary solution, and on which the extraction in mill by hyposulphite is calculated; preliminary sample, taken before sluicing the tailings; and the *top*, *bottom* and *general tailings samples*, already described.

On the general tailings samples the conteuts of the tailings are calculated.

The average of these samples for the run are as follows:

	Ounces Silver per ton.
Washed ore samples	24.4905
First ordinary	11.8174
Preliminary tailings	3.44
Top tailings	4.04
Bottom tailings	4.86
General tailings	3.7984

The following are the assays and laboratory determinations made on samples, and the calculations based thereon:

Charge samples, taken	Silver per ton	24.6289 ounces.
	Soluble salts	14.083 per cent.
	Calculated value (after deducting soluble salts)	28.6648 ounces.
	Chlorination	78.9882 per cent.
	Extraction	89.7857 "
Washed ore samples	Silver per ton	24.4905 ounces.
	Showing an extraction of silver in roasted ore by washing with water of	14.5616 per cent.
	Chlorination	64.3261 "
	Extraction	88.5743 "
First ordinary	Silver per ton	11.8174 ounces.
	Showing an extraction of silver in roasted ore by leaching with hyposulphite of soda of	58.7738 per cent.
Final tailings	Silver per ton	3.7984 ounces.
	Showing an extraction of silver in roasted ore by all treatment of	86.7485 per cent.

* Read at the Florida meeting, March, '95, of the American Institute of Mining Engineers.

CALCULATION OF SILVER IN TAILINGS.

Weight of roasted ore	31,775.338	tons.
Soluble salts	14.083	per cent.
Weight of tailings	27,310.410	tons.
Average assay of tailings	3.7984	ounces.
Contents of tailings	103,702.36	ounces of silver.

From the above the following calculations are made:

Decrease in laboratory results by washing:		
Chlorination	14.6021	per cent.
Extraction	1.2114	"

RESULTS IN LABORATORY COMPARED WITH RESULTS IN MILL.

	Per cent.		Per cent.
Laboratory results on charge samples:	Chlorination, 78.9282	Extraction,	89.7857
Laboratory results on washed ore samples,	" 64.3261	"	88.5743
Mill results: Extracted by hyposulphite of soda	58.7738	By extra,	86,7485

MILL RESULTS BEHIND LABORATORY RESULTS.

	Per cent.		Per cent.
Based on charge samples, Chlorination,	20.1544	Extraction,	3.0372
Based on washed ore samples,	" 5.5523	"	1.8258

I will not undertake here to discuss the causes for the decrease in chlorination, or the changing of the silver chloride in roasted ore, to some other form which is not soluble in a solution of hyposulphite of soda, by the washing with cold water. A vast amount of experimenting was done during the year, and the conclusions arrived at may form the subject of another paper.

PRODUCT.

Silver was precipitated from solutions with sodium sulphide; part of the time with a polysulphide, Na_2S_2, made from caustic soda and sulphur, and part of the time with a monosulphide, Na_2S, imported from Germany in the form of crystals. The total of sulphides produced was 442,576 pounds, divided as follows:

	Pounds.	Ounces per ton.		Ounces of Silver.
Solution sulphides	313,417	Assaying, 3790	Containing,	593,069.12
Wash-water sulphides.	95,442	" 2875	"	136,535.66
Dead carbonates	33,717	" 432	"	7,698.84
Total contents of product				737,303.62

DIFFERENCE BETWEEN "APPARENT" AND "ACTUAL" EXTRACTION.

In noting the difference between the "apparent extraction" (*i. e.*, the extraction determined by calculating contents of tailings as against contents of roasted ore) and the "actual extraction" (*i. e.*, that determined by calculating contents of product as against contents of roasted ore), attention is called to the fact that the contents of sulphides are based on "corrected assays," that is to say, the silver contents of scorification slag and cupel are added to the original assay. This addition was found, on this grade of sulphides, to amount to about two per cent. The ore contents are figured on the commercial assay by scorification, in which no account is made of silver contained in slag and cupel, the amount of which was found to be, on this ore, from 4 to 5 per cent.

APPARENT EXTRACTION.

	Ounces of Silver.
Contents of roasted ore	782,586.09
Contents of tailings	103,702.36
Calculated contents of sulphides	678,883.73
(On this calculation the apparent extraction of 86.74 per cent of the silver in roasted ore is based.)	
Actual contents of sulphides by corrected assay	737,303.62
(On this calculation the actual extraction of 94.21 per cent of the silver in roasted ore is based.)	
Differences between calculated and actual contents of sulphides = 6.78 per cent, or	58,419,89

ACTUAL EXTRACTION.

	Ounces of Silver.
Contents of raw ore	861,488 05
Contents of roasted ore	782,586.09
Loss in roasting and dust loss (9.157 per cent)	78,901.96
Contents of product	737,303.62
Or 94.21+ per cent of the silver in roasted ore and 85.58+ per cent of the silver in raw ore.	

CONSUMPTION AND COST OF SALT, COAL AND CHEMICALS PER TON OF ORE TREATED.

	Used per ton of Ore. Pounds.	Cost per ton of Ore.
Salt	244.48	$0.8719
Coal for drying ore and salt	85.77	.1322
Coal for roasting ore	117.44	.1819
Bluestone	13.45	.6331
Hyposulphite of soda	9.98	.3740
Chemicals for precipitating silver, including caustic soda, sulphur and sodium sulphide	18.86	.6835

DISCUSSION.

C. A. STETEFELDT, Oakland, Cal.: It has always been assumed by the writer, and also by others, that the silver volatilized by roasting in a Stetefeldt furnace was a minimum as compared with roasting in other furnaces. Now, Mr. Morse records at Aspen a loss of 9 and even over 10 per cent. Without doubting in the least the accuracy of Mr. Morse's statistics, I wish to say that it is not safe to draw general conclusions from a limited experience.

Unfortunately, I have no array of statistical figures at my disposal to combat Mr. Morse's statement, if he means to apply it to the Stetefeldt furnace at large, but must confine myself to general arguments.

In the first place, where ores are mined and reduced by the same company, accurate statistics in regard to the dry weights of the raw and roasted ores are not kept. This, for example, is the case at the Ontario and Marsac mills, Park City, Utah. In *Trans.*, xiv., 341, I have recorded experiments establishing the comparative loss of silver in roasting Ontario ore in the Howell and Stetefeld furnaces. In one of these experiments the loss of silver was 13.5 per cent greater in the Howell than in the Stetefeldt furnace. Now, if the Stetefeldt furnace had lost ten per cent silver, the loss in the Howell furnace would have been 23.5 per cent, which is not probable. In following the argument in my paper quoted above, it will be seen that the loss in roasting can be determined approximately by an indirect method. In the chloridizing roasting of base ores a considerable change in weight takes place, *i. e.*, the roasted ore, minus soluble salts, weighs considerably less than the raw ore before roasting. In comparing the value of the raw ore with the calculated value of the roasted ore minus soluble salts, the latter value should be greater in proportion to the change in weight, provided silver has not been lost. This change in weight can be determined by roasting average samples of ore in the muffle. From numerous determinations made in this way it appeared that the loss of silver by roasting Ontario ore in the Stetefeldt furnace would not exceed from two to three per cent.

Several mills using the Stetefeldt furnace have done custom work, namely, the Reno mill and the Manhattan mill, in Nevada, and the Lexington mill in Montana. Although I have no statistics from these mills at my disposal to prove my case, the following general argument will, nevertheless, have some weight:

The Reno mill did custom work exclusively, the Nevada Land and Mining Company having no mines of its own, and the business was very profitable while the supply of ore lasted. No complaint ever reached me as to extravagant loss of silver in roasting. Mr. Ottokar Hofmann was employed there for some time, and, since he never was an enthusiastic admirer of the Stetefeldt furnace, he would surely have published facts detrimental to its reputation if results had warranted him in so doing. The Manhattan mill, Austin, Nevada, did custom work most of the time, and sometimes exclusively. After the introduction of the Stetefeldt furnace this mill not only found a great saving in the cost of roasting, but also a higher percentage of extraction as compared with roasting in reverberatory furnaces. Having bought the exclusive right to use the Stetefeldt furnace in the Reese River district, they reduced their working charges and soon monopolized the buying of ores. Later on an opposition mill was again started with a Howell furnace. It had to shut down on account of inferior extraction, *i. e.*, as shown by Ontario experiments, great loss of silver in roasting. I have no Manhattan statistics to show, but would the Manhattan Company have paid a royalty on every ton of ore put through the Stetefeldt furnace for fifteen years if it had lost ten per cent of silver in roasting?

The Lexington mill at Butte, Montana, has often been running exclusively on purchased ores, and, as I understand, with profit. Mr. Rueger, the general manager of the company, a graduate of Freiberg and an able metallurgist (but not a member of the Institute) has never complained to me about losing money in consequence of having Stetefeldt furnaces at his mill. At the time I made the comparative test between roasting in Howell and Stetefeldt furnaces at the Ontario mill I applied to Mr. Rueger for statistics on the loss of silver in roasting at his mill, but he did not see fit to grant my request.

In conclusion, I offer some explanations of the large loss of silver by roasting in the Stetefeldt furnace at Aspen, as reported by Mr. Morse.

In the first place, the quantity of ore roasted per day (from 90 to 92 tons) was unusually large; and, considering that eight per cent of sulphur in sulphurets had to be oxidized, it follows that strong draft had to be used. No long flue connects the last dust chamber with the chimney at Aspen, as is the case at the Ontario mill. Under the circumstances, it is my opinion that a more extensive system of dust chambers would have collected a large portion of the dust and fumes passing out of the chimney.

In the second place, the character of the Aspen ore is highly ahnormal, on account of the high percentage of lime and magnesia it contains. Investigations at Aspen have shown, according to Mr. Morse, that the percentage of lime and magnesia in the roasted ore is largely reduced, and it must be assumed that these metals are volatilized as chlorides, their oxides not being volatile at high heat. It seems to me highly probable that these chlorides carried silver with them and thus caused, in part, the ahnormal loss at Aspen.

MR. MORSE: Replying to Mr. Stetefeldt's remarks on the loss of silver in roasting Aspen ores with a Stetefeldt furnace, as recorded in my paper, I would say that it was not my intention to attack the Stetefeldt furnace, but simply to report the actual results obtained at Aspen.

It is unfortunate that so little reliable information has been published on this very important operation in the treatment of silver ores either for amalgamation or for lixiviation; and it was this lack of published data that prompted the writer to give the Aspen results, in the hope that a discussion would follow which would bring forth the experience of others. Mr. Stetefeldt's "general argument," however, does not fill the bill. His experiments, as recorded in *Trans.*, xiv, 341, showing the comparative losses in roasting in Howell and Stetefeldt furnaces, offer a very roundabout way of attacking a very simple problem; and he does not arrive at the all-important fact of what the loss actually was with either furnace. The fact that Mr. Hofmann did not publish facts detrimental to the Stetefeldt furnace does not show that the loss of silver in roasting in a Stetefeldt furnace is not large.

I sincerely hope that others having reliable statistics on the subject will publish them.

The results at Aspen, as published, are made up from records very carefully kept, and the calculations are based on the average of thousands of samples and assays, so that an error in a few samples or assays would not affect the general result, and it will require more than "general argument" to convince me that I am in error.

The results of a series of experiments conducted by Mr. E. B. Kirby in the chloridizing-roasting of Aspen ores, in a reverberatory furnace, will be of interest in connection with this discussion.

The ores were practically the same as those treated at Aspen, and the average of lime (CaO) was 12.3 per cent, the highest being 25.5 per cent. Eighteen lots of about one ton each were roasted in a reverberatory furnace, with salt, for a sufficient time to give fully as high "chlorination tests" as the ore roasted in a Stetefeldt furnace. Each lot was weighed, sampled and assayed before and after roasting, and the average loss in roasting, including the dust loss, was found to be 6.64 per cent.

Mr. Stetefeldt's opinion that part of the silver loss is caused by the volatilization of lime and magnesia may be correct, although this did not seem to be the case in Mr. Kirby's experiments in roasting in a reverberatory furnace, where the silver loss on the ores carrying 25.5 per cent of lime was only 5.7 per cent.

It is undoubtedly true, however, that lime and magnesia are volatilized in the chloridizing-roasting of ores. A series of experiments made by Mr. J. Dawson Hawkins at Aspen, in which four lots of ore were roasted with about 12 per cent of salt, each lot was weighed and sampled, and lime and magnesia determinations made before and after roasting, showed a loss of 22.6 per cent of the lime and 48.3 per cent of the magnesia during the operation of roasting.

World's Coins' Values in U. S. Money.

Director of the Mint Preston submits an estimate of the values of the standard coins of the world:

The franc is the monetary unit of France, Belgium and Switzerland and is worth 19.3 cents. It is coined in both gold and silver.

The mark, the standard coin of Germany, is valued at 23.8 cents, but is only minted out of the yellow metal.

The Mexican silver dollar is worth 47.9 cents.

In Japan the yen is the standard, and although coined in both gold and silver, yet the former is the nominal standard. The gold yen is worth 99.7 cents; the silver yen exchanges for 47.6 cents.

China has a silver unit—the tael—whose value varies in different colonies. Its average value is about 69 cents. The silver peso is the unit of the Central American republics, and is worth 44.1 cents.

In Chili and Cuba, where a gold peso passes as the unit, it is worth 92.6 cents. The lira is Italy's unit, and possesses the same value as the franc of France—19.3 cents. The florin of the Netherlands exchanges for 40.2 cents of United States money. It is coined in both gold and silver. The silver ruble of Russia is worth 35 3 cents; the gold ruble passes for 77.2 cents. The peseta of Spain, like the lira of Italy and franc of France, goes for 19.3 cents, and is coined in the yellow and white metals. The gold milreis of Brazil is worth 54.6 cents and the silver kran of Persia only .081 cent. The smallest gold coin unit is that of Turkey—the piaster—valued at .044 cent. The silver rupee of India exchanges for 21 cents of American money and the gold crown of Austria 20.3 cents.

BRITISH COMMENT on a statement in one of the London dailies a few days ago is "calculated to alarm those who look to railway dividends for their incomes." "American engineers seem to be all agreed that steam railways are doomed within a quarter of a century, so far as America is concerned." The comment is: "If this is true of the United States, it is difficult to see why it should not be equally true of Great Britain."

"THE country is filling up with men all the time, machines are constantly throwing more men out of employment and improvements enable the unskilled to take the place of the skilled; what is going to be the result?" asked a mechanic a few days ago. The *Scientific Machinist* thinks that is a question no one man can answer. The solution rests with the American people.

THE aluminum plates being rolled for the yacht Defender are the largest ever rolled from this metal. Some of them weigh 200 pounds, and are five-sixteenths of an inch thick, 13 feet 10 inches long and 38½ inches wide.

Buying and Selling Mines.

To the Editor:—In the last issue of your paper, "Miner" calls attention to the announcement that capitalists of New York are about to form an association for the sale of mines. He then proceeds to criticise and condemn such proposed action of the capitalists, and ends by indicating what, in his opinion, is the proper thing to do.

Many persons, I think, will fail to agree with the arguments advanced by "Miner," and to accept either his statements or deductions.

That men of wealth and standing, of experience in mining matters, and widespread influence in the money centers of the world, should determine to actively iuterest themselves in searching out good mines and then, by placing them in the markets of the world, bring iu the capital for their purchase and operation, would seem to be a substantially good thing all around. In no way does it appear that large amounts of money can be so surely and so speedily brought to this State for investmeut in mining enterprises. Nothing inspires the confidence of capital more than the experience and responsible character of those offering it investment, "Miner" to the contrary notwithstanding.

"Miner" is greatly mistaken in his assertion that "anybody" can sell miues, and without capital. To find a mine is a hard thing. To secure the privilege of selling it when found, equally as hard. And to sell it, if the proposition involves a large amount, as is usually the case when real mines are sold, is a difficult task, requiring much patience, often great labor, aud frequently the expenditure of a considerable sum of money. Every one who has tried to secure a good mine for sale, and then to sell it, knows the difficulty, uncertainty aud expense of the undertaking.

If "anybody could sell mines," as "Miner" states they can, we would all be in the business, for when the sales are made the profits are very handsome.

"Miner" is also in error in his statement that capitalists canuot understaud why men of wealth and shrewdness should offer for sale things which they themselves might be able to buy. All the world is doing this, more or less, every day. If it were not so, ordinary business would not be transacted, and uo great enterprises would ever be undertaken. In the mining industry more than in any other, does capital know that such must be the case, and in no other period of history has this fact been more couvincingly evidenced than is now shown in the great miniug centers of the world.

"Miner" is also deceived in his belief that what we want of capital is to take our prospects, develop them, repay itself for all outlays made, and then pocket the lion's share of the remainder for having done so.

What is wanted of capital is to take hold of the large propositions, and those involving great amounts of mouey, to stimulate and create confidence in the industry, and to put coin in circulation. We, of lesser means, will then be able to handle the smaller affairs, and we will all of us be profoundly glad of the coudition of things which enables us to do so, and for the opportunities and possibilities left for us. If capital should absorb the industry, from the grass roots up, we smaller fry would be robbed of our birthright, and all the incentives to manly aud persistent effort in our chosen line takeu from us.

June 27th, '95. MINER TOO.

Mineral Land Inquiry at Sacramento.

To the Editor:—Having just taken my medicine in a hearing as to the mineral character of lands at Sacramento, and seen the workings uuder which the inquiry is held, I think it will save other miners a great deal of disappointment and trouble if they know the procedurc and go prepared. The citations published in the local papers appear to be for the miner as a Government witness, but this is not so, for he must pay the expenses of taking testimony at the rate of $5 for each witness, payable in advance, before he is recognized at all. He must also have an attorney, or he will be iu the same fix with the majority of miners that went to Sacramento while I was there, and who virtually became witnesses for the railroad aud against themselves, the railroad attorney kindly volunteering to act as attorney for both sides, as he put it, to bring out the facts in the case, about like this: There is some pasture land, some could be farmed, some would raise vegetables, some timber, and the land is generally mineral in character. Then a short discourse on the goodness of the railroad company to the miner, the fairness they have again shown, and the unwarranted attacks of the newspapers and politicians. That finishes his case, and so on until a fight is made for some piece valuable for mining, and where the miner is not satisfied to prove the general mineral character but intends the specific mineral character of a certain piece of land shall be demonstrated once for all, then we have a different procedure; we find the railroad secretary has made a special trip to that part of the country, has gathered willing tools to swear to anythiug, and if they can't swear away the shafts, tunnels and mining machinery in evidence they will swear they are on some other subdivision and not on the land in question, thus making it almost absolutely necessary for the miner to have an official survey made, and to take a surveyor with him as witness.

Would it not be a good idea for some of the miners' association funds to be expended for a lawyer to be in attendance at the laud office, and not let the old miners, who go to Sacramento to save from confiscation the properties they have worked a lifetime, be made the laughing stock and tools of the company?

As to what railroad witnesses will swear to, I can give you the following sample: One piece of land in dispute was lot 6 of section 17, adjoining the town of Ophir. The ground covered by mining claim is mined out. A steam boiler is on the ground. A perpeudicular shaft ninety feet deep is in plaiu view from the county road, as are also twenty or thirty other dumps of mining shafts, sunk during a period of thirty-five years. Yet, four witnesses swore positively that there never had been any mining done on lot 6; the fifth one weakened and acknowledged there was a hole in the ground—he didn't know but it was a cellar. One witness, George Betterle, a laborer living near by, even swore the mine in question had never paid and was worked out, and if it had he would have known it. He was also able to swear the adjoining mine (Eclipse), with a U. S. patent, had never paid anything, and if it had he would have known it, when it is notorious that some of the richest ore in the camp has been taken out of these mines, some of the waste dump paying $68 a ton, and which facts are knowu by everybody in camp.

Ophir, Placer Co., Cal., June 24, '95. O. T. W.

The Pelton System of Power.

Fourteen years ago L. A. Pelton, a resident of Nevada county, invented and put upon the market what is now familiarly known as the "Pelton Water Wheel." This, like all great inventions, was so simple an affair that the wonder is it had not been thougbt of before, and yet four years of study and experimentiug were required to develop and perfect it. Little was thougbt at that time of the important part this was to play in the mining and industrial development of the Pacific coast, as well as the country at large, in future years.

The Pelton wheel was first brought into prominence by a test at the Idabo mine in Grass Valley in 1884, at which all the prominent wheels then in use in this State were represented. The Pelton showed by brake test an efficiency of 87 per cent—a result now generally obtained and sometimes exceeded in practical work—and was immediately adopted by that company, twelve of them being installed at that time and four more a year later. These sixteen wheels have been running in connection witb the mine and works of that company during all this time without stoppage and with practically no expense in the way of repair or loss of efficiency.

Since then these wheels have been sent to almost every country on the globe—more than 6000 being now in operation, running under beads varying from 12 up to 2100 feet, and aggregating some 400,000-H. P. It is quite within bounds to say that tbis is one of the most useful as well as illustrious inventions this country has ever produced, making possible the utilization of this great, natural, native force under all conditions and for every variety of service, with a useful effect never before obtained and in so simple a way that machinery may be said to be almost dispensed with.

In a series of papers under the heading of "American Supremacy in Applied Mechanics," Dr. Coleman Sellers, one of the most noted engineers of this country, makes the following statement:

"One of the most noted instances of the practical solution of a mechanical problem is given in the development of the Pelton water wheel, a system worked out entirely by and through experimentation.

"Results have been achieved by these improvements on wheels that were among the earliest used, so that the history of the Pelton wheel is typically American, and stands as a monument of human ingenuity, meeting the definition that has been given of mechanical engineering—common sense applied to practice."

Prof. Thos. Egleston, of Columbia College, an eminent hydraulic engineer, in a recent communication, says: "I have had occasion several times to recommend the Pelton wheels in the most earnest way and to bring them to the attention of engineers, as I believe them to be tbe best wheels at present in use."

Many similar statements from the highest recognized authorities on hydraulic engineering in this country, as well as in Europe, could be given, but your readers are too familiar with the practical side of this question to need any further reference.

There has been much theorizing of late about regulation in connection with water wheels operating electric generators, and, by inference, an assumption that complete success has not been attained in this way. The Pelton Water Wheel Co. do not refer to what *may be done but what has been done*, and, in verification of this statement, offer some such substantial evidence as the following. The President of the Standard Mining Co., of Bodie, says:

"Of our differential governor I cannot speak too highly. It is quick acting, sensitive and in every way reliable, and can he depended upon to take care of any changes of load that may occur at the motor end of the transmission—13 miles away. The one drawback to the use of water power for running electrical machinery—heretoforc considered insurmountable—has been the want of a governor that could be relied upon to take care of the sudden variations of load constantly occurring, more particularly when used for power purposes.

"This want you have supplied in so satisfactory a way as to leave nothing to be desired."

The President of the Redlands Electric Light and Power Co., running an 800 H. P. plant, makes the following reference to their governing appliance:

Your differential governors afford absolute control of the wheels and maintain a uniform speed on the generators under all variations of load even with the extreme changes caused by starting and stopping the 150-horse power synchronous motor at the ice house 4 miles away. The regulating device is simply perfect and meets the most exacting requirements of electrical service.

The Weaverville Electric Light Co., referring to the matter of regulation, report as follows:

The power plant furnished by you for this Company is perfect in all its appointments and has given perfect satisfactiou to all concerned. The wheel works to a high degree of efficiency and the regulation afforded by your differential governor is all that could be desired. The lights are perfectly steady under all variations of load, in fact, the plant runs itself, only one man being required in the power house. BLAKE & GIVEN.

A large number of additional references of similar character can be given, bearing upon this subject, whieh, it will be conceded, carry more weight than conjecture or theory.

San Francisco, June 26, '95. GEO. J. HENRY, JR.

The Union Gas Engine Company of San Francisco, Cal.

The illustrations in this issue of the PRESS give some idea of a few of the extensive uses to which the gas engines manufactured by the Union Gas Engine Company of San Francisco, Cal., are being applied. In view of the economy, practicability and efficiency of the Union engines, as attested by the fact that over sixteen hundred are in daily operation on this coast alone, besides the large number used in the East, a brief sketch of the origin and rapid progress of these pioneer manufacturers of gasoline engines will be of interest: Less than six years ago two small machine shops, one at 230 Fremont St. and anotber at 213 First St., in this city, respectively under the management of John F. Daly and Daniel S. Regan, began to build and place upon the market gas engines in which the explosion was effected within the cylinder by means of an electric spark. Tbough the practicability of this principle was regarded with some degree of doubt, even by mechanical engineers and men who had experimented with the older types of gas engines, there were still many who had faith in its success, and the engine with the sparking device rapidly grew in favor. In the meantime a company had been organized by John F. Daly, under the title of tbe "Pacific Gas Engine Company," and another by Daniel S. Regan, called the "Regan Vapor Engine Co." As Messrs. Daly and Regan had at one time been associated in experiments along these lines, quite naturally their engines had some points in common. This fact led to litigation tbat bid fair to seriously retard the success of both companies. After some stubborn fighting the two companies wisely decided to consolidate, which they did May 16, 1892, incorporating under the name of the "Union Gas Engine Co.," with a capital stock of $300,000. Being thus enabled to unite and preserve the best features of both engines, the result was what might have been looked for—a high-grade motive power, compact, durable and efficient. The new company, under the management of J. F. Daly, proceeded to enlarge and refit the plant at Nos. 221 and 223 First street, where it continued for two years or more to manufacture and turn out a large number of engines adapted to every purpose for which motors ranging from 1 to 80 H. P. are required. The business having now outgrown its limited quarters, tbe company decided to erect a specially designed building, with every convenience for construction tbat past experience and ingenuity could suggest.

Its new home—the present two-story brick structure—has 50 feet frontage by 150 feet in depth at 309 and 311 Howard street. The interior is arranged upon tbe "Gantry" system, the second floor being practically a broad gallery extending across the front and back the entire length of botb sides, leaving the first floor open to the light from the skylight which runs the length of the roof. Ranged along both sides of this long, light well are the lathes, drills, planers and otber appliances for conducting the work in hand. Between the galleries is a traveling crane by which tbe heavy work is bandled with comparative ease. The front end of the gallery is occupied by a bandsome suite of offices, drafting room, etc., while the front of the first floor is shared by a large show room and an arched driveway for the entrance of heavy trucks. From forty to fifty skilled men are constantly employed; the monthly pay-roll being $2500 to $3000.

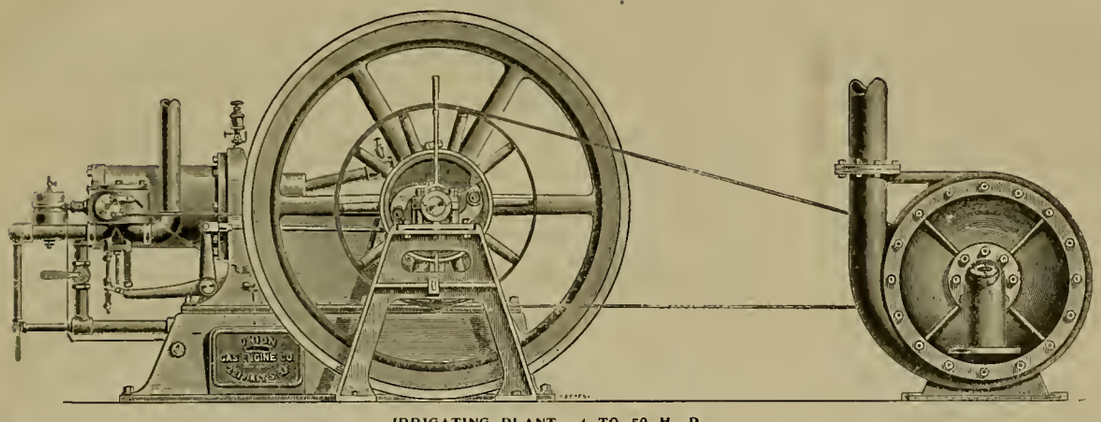
In addition to the home factory, this company has established large works in Philadelphia—the "Globe Gas Engine Co.," under the management of W. J. Casey, formerly of San Francisco, and one of the original incorporators. This move was made necessary in order to meet, with facility, the increasing demand for the "Union" engines in the Atlantic States. It has ever been the policy of the company not to allow pains, expense nor prejudice to stand in the way of needed improvements in bringing the "Union" engines up to their present high stage of perfection. Recognizing the growing demand for a simple aud economical propelling power for light pleasure craft, the company has given special attention to this branch of its business. Tbe result is a marine engine, simple and safe to operate, compact and graceful in design. To this has been recently added a new form of reverse gear, through which, by the movement of a single lever, witbout noise or jar, a boat may be driven ahead, held steady or backed with perfect ease. Tbis is an important feature, as the many devices for the purpose that have been invented and discarded clearly indicate. Tbis same mechanism is also applicable to the mine-hoisting machinery which the company manufactures. The "Union Marine Gas Engines" are now propelling boats on many waters, the craft ranging in size from launches not much larger than a skiff to freight and passenger boats of many tons burden. Quite a number of yachts and coasting schooners are also provided witb "Union" engines of from 10 to 100 H. P. as an auxiliary aid to sails in time of calms or storms.

FIGURE 2 on the first page shows the "Santa Monica," a passenger boat plying between San Pedro and Catalina Island, some 25 miles off the coast of soutbern California. Her length is 48 feet, beam 12 feet. She is fitted with a 20-H. P. "Union" marine engine, and made the run from San Francisco down the coast, a distance of 417 miles, in 41 hours. FIG. 3, "Yolo Belle," is owned by a firm in Sacramento, Cal., and carries freight and passengers on the river. Her length is 48 feet; beam, 10 feet; engine, 20-H. P.; average speed, 10 miles per bour in good water. FIG. 4 is a flat-bottomed sternwheeler, light draught, for use on Eel river and Humboldt bay, Humboldt county, California, where she has been in service about three years, giving entire satisfaction—propelled by a 15-H. P. "Union" gas engine. FIG. 5 shows the latest double-cylinder type of the "Union" marine gas engine, with improved reverse gear attached.

Besides the marine type the company builds both vertical and horizontal patterns, adapted to operating pumps for irrigation, machine shops, dairy plants, hoisting works for mines, quartz mills, electric lighting plants, etc.

It is but a few years since prejudice placed such limitation of capacity upon these engines as to quite debar them from competition with steam beyond certain very light work. As an illustration of how this feeling is giving way before practical demonstration: a few weeks ago the "Union" Company built and shipped to the Sterling Mining and Milling Company, of Payrump, Nye county, Nevada, a 25-H. P. hoisting plant of its own special design. In May the Sterling Company ordered another 25-H. P. hoisting plant, one 40-H. P. engine for stamp mill and one 40-H. P. engine for a "Huntington" roller mill, aggregating 130-H. P., still further exemplifying the extending limit of capacity of these engines. There is in course of construction by the "Union" gas engine works an 80-H. P. marine engine of special design, to be placed in the magnificent palace yacht now being built for the young California millionaire, Charles L. Fair. This engine is to be accompanied by a 6-H. P. auxiliary, which will be used as a starter for the large motor, and also to run a dynamo for lighting and heating. Tbe new craft will be 96 feet ou the water line and 18 feet beam, fitted throughout in the most thorough manner, as it is calculated to weather seas in any part of the world. While the rapid and almost phenomenal success of the "Union Gas Engine Company" is largely due to the recognized merit of the work it turns out, still an important factor in its progress has also been the untiring enterprise, ingenuity and business ability of its officers—John F. Daly, president and manager; H. P. Coles, secretary and treasurer. Cheerful response will doubtless be made to tbose who wish to obtain more detailed information in regard to the "Union Gas Engine."

Union Gas Engine Co.



IRRIGATING PLANT—4 TO 50 H. P.

Pioneer Manufacturers

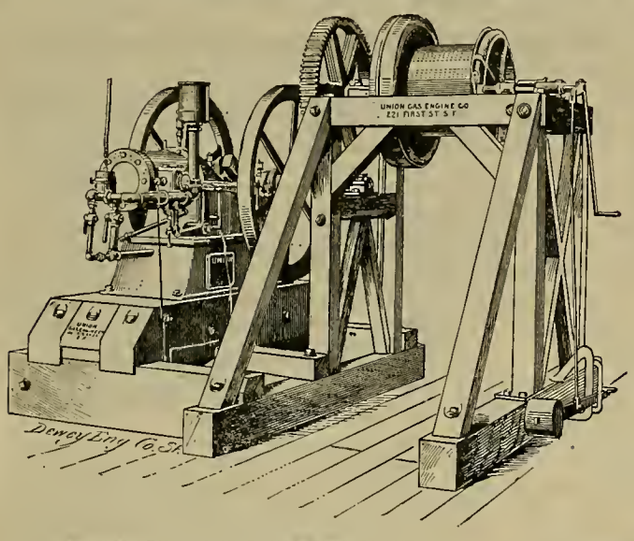
Of Gasoline Engines, and

Owners of 20 Patents

on same.

COURTLAND, April 9th, 1893.

UNION GAS ENGINE CO., San Francisco, Cal.—Gentlemen: I write to tell you how my "Union" Engine is working. The first day I got it I put it to pumping water to drain my ranch from rain and seepage water. My engine, an 8 H. P., and a No. 6 centrifugal pump, I started at 9 A. M., and it ran all day without stopping. At 10 P. M. I filled the oil cups and went to bed, and never went near it until 7 o'clock in the morning, and it was running along as smoothly as when I left it the night before. The plant had no shed or cover whatever, and was out on the side of the levee a quarter of a mile from the house. After that I started it and ran 46 hours without stopping. Had it coupled to a tank holding 110 gallons gasoline. All I did was to oil the pump, and fill the oil cups morning, noon and night, and stay away from it all the rest of the time. Now I have been away five miles from home, having my horse shod; was away from my ranch about six hours, and no one near the plant, and when I came home the plant was working as smoothly as when I left. The pump throws about 75,000 gallons an hour. Taking the plant as a whole it is a wonderful one, running on less than 15 cents an hour, requiring no engineer, and no attention whatever but supplying with gasoline and oil. I have had experience with another kind of gas engine, and can cheerfully recommend your engine and pump to any one as a safe, simple, economical and in every way satisfactory plant. Most sincerely yours, ERNEST A. GAMMON.



SINGLE DRUM 12 H. P. HOISTING PLANT,
On Keystone Mine, Lincoln, Nevada.

KEYSTONE MINE, LINCOLN, NEVADA,
Feb. 20, 1894.

GENTLEMEN:—I wish to inform you that I recently set up one of your 12 H. P. Gasoline Holsting Plants for the mine, and was greatly pleased with the operation of same. Must say that I never saw a finer working piece of machinery than this hoist. It started at once, and we never had a hitch in the two months I operated it. The incline is about 40 degrees, and we hoisted a load of about 1800 lbs. at a speed of 290 ft. per minute, and at a cost so cheap that it astonished us, and we concluded to make an accurate test in order to ascertain the exact cost, so that there would be no mistake. The oil was carefully measured and we made a run of 112 hours on 30 gallons of gasoline. This test was witnessed by the manager of the mine, and he will indorse this statement.

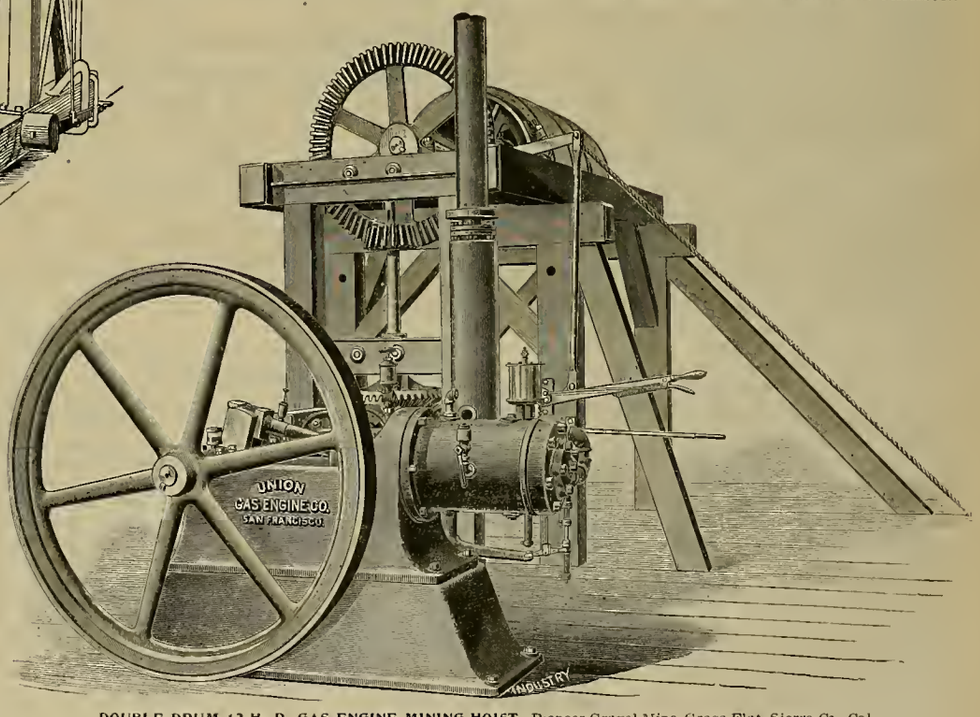
You can refer to me at any time, and I will be glad to speak a good word for your engines, for I am satisfied that when they are better understood by mining men, you will supply more mines. JAS. S. MURCHIE,
Mining Engineer.

The cut opposite is of a special form of hoisting plant as used in the Pioneer Gravel Mine, at Port Wine, near Grass Flat, Sierra county, Cal.

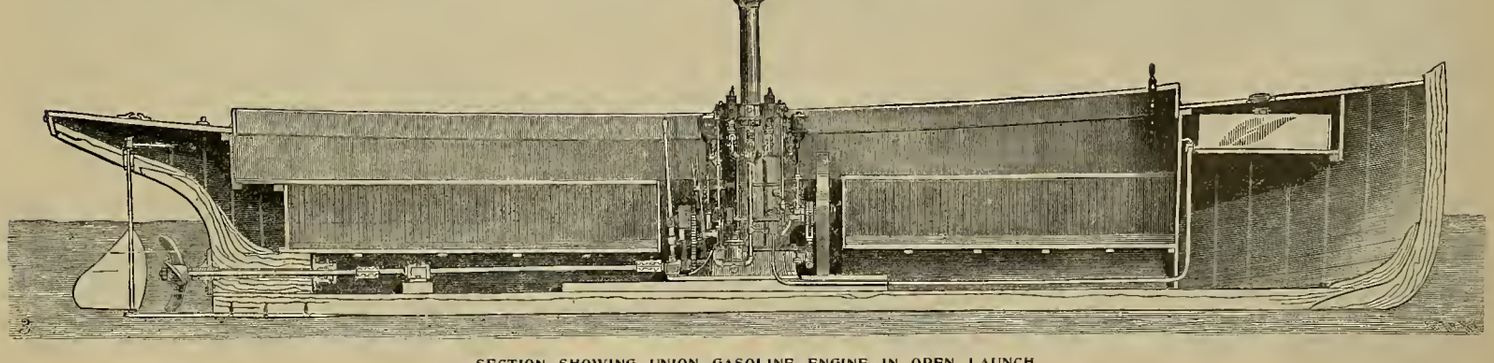
GRASS FLAT, SIERRA CO., CAL., Nov. 25, 1893.

UNION GAS ENGINE CO.—Gentleman: Since last July we have used one of your 12 H. P. Horizontal Gasoline Engines for hoisting and pumping. Our incline commences 1400 feet from the mouth of our tunnel, descending 150 feet with a one-foot-in-four grade. We use about 8 H. P. to pump 6000 gallons 33 feet an hour, and at the same time raise cars each holding about 3500 pounds of gravel. The tunnel is the usual-sized, single-track mining tunnel. The incline is double.

We hoist about 350 carloads each 24 hours. To do so it is only necessary to run the engine between five and six hours a day. We do some hoisting each hour, but when the engine is not actually running all expense as to fuel is cut off. With steam we would have to keep up a full head all the time, and an engineer at his post, not to mention the danger of explosions, and the consequent filling of the works with scalding steam and coal gases. Yours truly,
J. F. COWDERY,
325 Montgomery St., San Francisco, Cal.
CHAS. S. DEISEM, Superintendent of the mine.



DOUBLE DRUM 12 H. P. GAS ENGINE MINING HOIST—Pioneer Gravel Mine, Grass Flat, Sierra Co., Cal.



SECTION SHOWING UNION GASOLINE ENGINE IN OPEN LAUNCH.

UNION GAS ENGINE CO., 309-311 Howard St., San Francisco, California, U. S. A.

Illustrated Catalogues will be mailed wherever required.

Gold and Silver Product of '94.

The annual Government report of the mineral resources of the United States for the calendar year 1894, compiled under the supervision of Dr. D. T. Day, Chief of the Mineral Department of the Geological Survey, is based on reports of experts and special agents. The total product shows a decline from the output of 1893.

The total product was valued at $524,955,131. The total value of non-metallic mineral products was $305,786,343; metallic, $218,168,788, and unspecified mineral products estimated at $11,000,000.

The official result of the investigation of the metallic products for the year are as follows, arranged by quantity and value:

Pig iron, 6,657,388 loug tons, $65,007,247 valuatiou.
Silver, 49,501,122 troy ounces, $64,000,000.
Gold, 1,190,816 troy ounces, $39,500,000.
Copper, 360,244,218 pounds, $33,141,142.
Lead, 159,331 short tons, $9,942,254.
Zinc, 75,328 short tons, $5,288,026.
Quicksilver, 30,416 flasks, $934,000.
Aluminum, 550,000 pounds, $316,250.
Antimony, 200 short tons, $36,000.
Nickel, 9,616 pounds, $3269.
Platinum, 100 troy ounces, $600.

The non-metallic mineral productions are the following:

Bituminous coal, 118,820,405 short tons, $107,653,501.
Building stone, $37,092,102.
Petroleum, 49,521,757 barrels, $35,800,532.
Natnral gas, $12,000,000.
Clay (all except potters'), $9,000,000.
Cement, 360,000 barrels, $800,000.
Mineral water, 8,362,245 barrels sold, $5,030,081.
Phosphate rock, 21,569,608, $3,742,846.
Salt, 967,059 barrels, $3,395,988.
Limestone for iron flux, 11,683,703 long tons, $4,455,171.
Zinc, white, 3,368,350 short tons, $1,894,275.
Potters' clay, 21,443 long tons, $1,500,975.
Gypsum, 239,312 short tons, $761,719.
Borax, 14,680,130 pounds, $974,445.
Mineral paints, 4,192 short tons, $498,093.
Grindstones, $223,214.
Asphaltum, 60,570 short tons, $353,400.
Precious stones, $132,250.
Pyrites, 105,940 long tons, $363,134.
Corundum, 1495 short tons, $95,936.
Manganese ores, 6308 long tons, $53,635.
Sulphur, 500 short tons, $20,000.

The report says pig iron production decreased from 7,124,502 long tons to 6,657,388, and the valuation decreased nearly $20,000,000.

The gold product for the year is the largest since 1878, increasing from 1,739,081 troy ounces for 1893, with a coining value of $35,950,000. Silver production declined over 10,000,000 ounces. The rapidly increasing zinc product was checked in 1893 and 1894, and a slight decline noted in both years. The exhaustion of the Virginia pockets of ore caused a decline in the mauganese product, which was less than half the output in 1892. The nickel product was reduced to one-fifth of the 1893 output, and antimony valuation decreased $9000. The product came from Nevada and was smelted in this city.

The petroleum export was the largest yet recorded—over 100,000,000 gallons more than in 1893. The value of rough gems decreased from $264,041 in 1893 to $132,250 in 1894. The mica industry is still supplied by irregularity in mining methods, and mineral waters declined over $500,000 in value,

It will be interesting to readers of the MINING AND SCIENTIFIC PRESS, who take interest therein, to note that the United States, according to Mr. Preston's reports, stands third in the list of gold-produciug countries. Mr. Preston is usually a very careful statistician, and if he sends out a report over his official signature it is only after comparison. According to his report, which is too long to be published in detail, the yield of gold in Australasia during the calendar year 1894 was 62,856 kilograms, valued at $41,760,800; in South Africa, 60,707 kilograms, worth $40,346,000, aud in the United States 59,434 kilograms, worth $39,500,000, placing this country below Australasia and South Africa in the gold yield of '94.

Without disputing the accuracy of Mr. Preston's figures, it may be said that the Australian Department of Mines in their report, just to hand, officially give the Australasian product for '94 a total value less than that accorded it in our Mint Director's report, aggregating $35,786,426, at an average fineness of 825.

While the Director of the U. S. Mint should be an authority on fineness of gold, it is possible that allowing a higher figure for the average fineness of gold in Australasia than the facts will be found to warrant has occasioned the apparent superiority in aggregate gold yield in Australasia, and that the same thing will affect the final returns of South African gold values.

The world's annual gold yield is a difficult aggregate to procure, but without caviling with Mr. Preston's figures it may be said that his announcement in this regard is not accepted as definitely conclusive.

Robinson Gold Mining Company's Report.

The following from the general manager's report of one of the leading South African mines is interesting as illustrative of their methods and results:

Mine—Quartz milled, 9215 tons. Development—Drives, 549 feet; raises, 385 feet; crosscuts, 225 feet; shoots, 27 feet—total, 1186 feet. Main incline shaft west: Fifth level—Raises, 53 feet. Sixth level—Driving west on south reef, 23 feet; raises 32 feet; crosscuts, 70 feet. Seventh level—Driving east and west on main reef, 84 feet; raises, 30 feet. Eighth level—Driving east on main reef, 41 feet; raises, 34 feet. Ninth level—Driving east and west on main reef, 63 feet; main crosscut, 38 feet. Tenth level—Driving west ou main reef, 30 feet; raises, 8 feet; shoots, 16 feet; crosscut, 39 feet. Main incline shaft east: Fifth level—Driving east on main reef, 24 feet. Sixth level—Driving west on main reef, 45 feet; driving west on south reef, 21 feet; crosscuts, 15 feet. Seventh level—Driving west and east on main reef, 42 feet; driving east on south reef, 48 feet; raises, 112 feet; crosscuts, 9 feet. Eighth level—Driviug east on main reef, 42 feet; raises, 90 feet. Ninth level—Driving east on main reef, 59 feet; main crosscuts, 32 feet. Tenth level—Driving east on main reef, 27 feet; raises, 87 feet; main crosscuts, 22 feet—total, 1186 feet. Mill—Stamps at work, 70; net running time, 28½ days; tons crushed, 9215; tons per stamp per diem, 4.4; gold won from above, 8789 ouuces 5 dwts. Chlorination and cyanide works—Gold won from own concentrates by chlorination, 1203 ounces; bullion from tailings (cyanide process), 2011 ounces 15 dwts. From own ore, 12,004 ounces. Gold from concentrates purchased (by chlorination), 2092 ounces 18 dwts. Total, 14,096 ounces 18 dwts.

EXPENDITURE AND REVENUE.
(Crushed, 9215 tons.)

WORKING EXPENDITURE.		Cost per ton
Mining account, including mine maintenance	£ 7,490 3 0	£0 16 3.08
Milling account, including mill maintenance	1,875 11 7	0 4 0.85
General maintenance account	135 10 0	0 0 3.53
General charges	1,161 14 2	0 2 6.77
	£10,682 18 9	£1 3 2.23
Expenditure on mine development, including main shaft	3,679 9 9	0 7 11.83
Expenditure on machinery, plant and buildings	935 2 0	0 2 0.35
	£15,297 10 6	£1 13 2.41
Retreatment account:		
Working expenses at cyanide and chlorination works	2,076 3 2	
Cost of concentrates purchased, including receiving	6,460 14 3	
		£23,834 7 11
Profit for month		29,004 10 0
		£52,838 17 11

REVENUE.		
Gold account (mill), 8789 ounces 5 dwts.	£31,641 6 0	
Sundry revenue	800 0 0	
		£32,441 6 0
Retreatment account:		
Gold account (tailings), 2011 ounces 15 dwts	£ 6,669 5 0	
Gold account (own and purchased concentrates), 3295 ounces 18 dwts	13,595 12 0	
		20,264 17 0
Plus amount received in excess of book entry for February gold		132 14 11
		£52,838 17 11

The sum of £11,108 7s 7d was expended on account of mill extension during the month.

In a recent lecture on the use of aluminum in vessel construction, Mr. Yarrow, the noted English shipbuilder, said that the two great enemies of the metal are heat and alkalies. The metal anneals at a comparatively low temperature, thus losing strength, while alkalies act very rapidly upon it. Consequently any part liable to be subject to a considerable rise of temperature should not be made of aluminum, nor should it be used for a condenser where soda may be required for cleaning purposes. Alumiuum at high temperatures oxidizes with exceptional rapidity. At low temperatures it does not oxidize so rapidly, and the film of oxide on the surface protects the metal from further action.

PROFESSOR CARL MYERS of Frankfort, N. Y., has begun supplyiug ocean vessels with balloon outfits. A tank containing the materials for generating hydrogen gas, to inflate the bag, is provided with the necessary fittiugs and cork. It is believed that the same wind which sends a ship ashore can be made to carry a line to life-savers on the beach.

DURING the meeting of the American Institute of Electrical Eugineers at Niagara Falls this week, the formal starting of the great plant of the Niagara Falls Power Company will occur. At present only one of the 5000 horse power dynamos is in place, ready to supply local customers, but work on two more of them is in progress.

OVER 84,330,800 barrels of petroleum were produced in 1894. These figures cover the total production of the world. Of this amount the United States produced 57 per cent and Russia 40 per cent. In 1859 the total production of the United States was only 2000 barrels.

ELECTRIC LAMPS of one-candle power, operated by a storage battery weighing 2½ pounds, and good for ten hours without recharging, are among the latest novelties. The battery is about six inches high and two inches square.

Mining in Old Mexico.

Mining in Mexico is not in a depressed condition because of the low price of silver. This particular industry is prosperous there. The peso or dollar and onza Mexicana is now, and always was, on its equality or standard ratio of $1.21 to one ounce. The peso or onza buys as much there to-day of all the necessaries of life as it always did, and the man in Mexico who works out his silver mine has never felt or known that silver has dropped in value. On the contrary, he has been largely benefited by the drop in silver, as most mines contain in addition gold and other metals which are always paid for according to the gold standard; that is, for his silver he iu turn receives his silver in dollars, and there can be no loss while for his gold he receives to-day from $36 to $38 per ounce in silver.

Under the new Mexican law mining is especially encouraged. The preliminary denouncement of a mine costs from $15 to $25 and requiries publication in the official paper of the capital of the State for ninety consecutive days. At the end, if the party desires a patent, he pays the federal treasury $10 for each pentenencia 325 feet square; hereafter an annual tax is demanded of $10 per pentenencia, and no further obligation or work is required. Prices vary from responsible positions at $4 per day to $1.25, which, when the capital comes in gold from the outside and is exchanged into Mexican silver, makes it doubly cheap. Hundreds of mines in Mexico are paying handsome dividends, which in the States could not be worked at all under the present silver depression.

The famous Candelaria mine, which has paid its successive owners in the course of 200 years over $150,000,000, is now working on ore which pans only $25 to $28 per ton. The San Dimas district, in which the Candelaria is situated, is said to be the richest in Mexico. Most of the large mines there are in the hands of Americans. The Candelaria, owned by D. M. Burns and Clarence Matertiame of this city, a group of mines belonging to the Hearst-Haggin Co.; the Coronado property of J. N. E. Wilsou, and the Promontores, an old mine recently acquired by F. M. Ochoa and other San Franciscans. All these mines, except the latter, are low grades of free milling gold ores, while the Promontores hardly goes ten per cent above the others. It is the present advantage of exchange and cheap labor which more than anything else makes those profitable.

Silver-Lead Ore Sampling.

Sealed proposals are invited by the Secretary of the Treasury for the sampling and assaying of lead ores imported into the United States under the provisions of the tariff act. This act imposes a duty of three-fourths of one cent per pound on the lead contained in silver-lead ores, aud under its provisions it is necessary that facilities for sampling and assaying shall be provided, at the expense of the party receiving the contract, at each of the ports at which silver-lead ores are imported. The method of sampling and assaying such ores is to be the same as that usually adopted for commercial purposes by public sampling works in the United States, and the bidder must stand under oath for the facilities under their control for performing the service, and the method in detail which they propose to use. The right is reserved to reject any or all bids, and to award the contract to one bidder for all the work, or to accept separate bids for the general ports at which ores are imported.

SOME usefnl products from what may be termed a novel source are enumerated by the *Revue Scientifique*, as showing the ingenuity and diversification of modern industry, and the value of that bandit of the sea, the shark. Thus the liver of this predatory creature is found to contain an oil of a beautiful color, which never becomes turbid, and possesses medicinal qualities of a very valuable character; the skin, after being dried, takes the polish and hardness of mother of pearl, and on being marbled bears a resemblance to fossil coral, so that it is employed by jewelers for the manufacture of fancy objects, by binders for making shagreen, and by cabiuet makers for polishing wood; the fins, independent of use by some as an article of food, are superior for conversion into fish glue, competing in this line with the well-known sturgeon glue prepared in Russia, and are used for clarifying beer, wine and other liquors, also for the preparation of English taffetas, and as reagents in chemistry, etc.; the flesh, too, despite its oily taste, is in some places eaten as food.

THE first manufacturing establishment at a distance from Niagara to contract with the power company for electricity from the great cataract is the Plumb, Burdict & Barnard Bolt and Nut Works of North Tonawanda, twelve miles away. This company will use about 200 horse power, applied through sixteen motors.

TO BE CONSTANTLY QUOTED is certainly a sure sign of successful newspaper work. It means that the best judge of a newspaper, the exchange editor, is passing his favorable opinion.—The Fourth Estate.

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FULTON ENGINEERING AND SHIPBUILDING WORKS.

MINING AND MILLING MACHINERY,

ADAPTED TO EVERY DESCRIPTION OF MINING AND MILLING.

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IMPROVED CRAWFORD MILL.

The Cheapest and Best Mill for extracting gold from comparatively free milling ores. Requires one-third the water, and three-fourths the power of stamps. Costs less, is operated cheaper, and will save 20 to 40 per cent more gold. Average saving 85 per cent. Inexpensive foundation. No plates or screens. Wear and tear guaranteed not to exceed thirty cents per ton. Capacity ten tons. Full particulars,

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MANUFACTURERS OF

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Buying and Selling Mines.

To THE EDITOR:—In the last issue of your paper, "Miner" calls attention to the announcement that capitalists of New York are about to form an association for the sale of mines. He then proceeds to criticise and condemn such proposed action of the capitalists, and ends by indicating what, in his opinion, is the proper thing to do.

Many persons, I think, will fail to agree with the arguments advanced by "Miner," and to accept either his statements or deductions.

That men of wealth and standing, of experience in mining matters, and widespread influence in the money centers of the world, should determine to actively interest themselves in searching out good mines and then, by placing them in the markets of the world, bring in the capital for their purchase and operation, would seem to be a substantially good thing all around. In no way does it appear that large amounts of money can be so surely and so speedily brought to this State for investment in mining enterprises. Nothing inspires the confidence of capital more than the experience and responsible character of those offering it investment, "Miner" to the contrary notwithstanding.

"Miner" is greatly mistaken in his assertion that "anybody" can sell mines, and without capital. To find a mine is a hard thing. To secure the privilege of selling it when found, equally as hard. And to sell it, if the proposition involves a large amount, as is usually the case when real mines are sold, is a difficult task, requiring much patience, often great labor, and frequently the expenditure of a considerable sum of money. Every one who has tried to secure a good mine for sale, and then to sell it, knows the difficulty, uncertainty and expeuse of the undertaking.

If "anybody could sell mines," as "Miner" states they can, we would all be in the business, for when the sales are made the profits are very handsome.

"Miner" is also in error in his statement that capitalists cannot understand why men of wealth and shrewdness should offer for sale things which they themselves might be able to buy. All the world is doing this, more or less, every day. If it were not so, ordinary business would not be transacted, and no great enterprises would ever be undertaken. In the mining industry more than in any other, does capital know that such must be the case, and in no other period of history has this fact been more convincingly evidenced than is now shown in the great miniug centers of the world.

"Miner" is also deceived in his belief that what we want of capital is to take our prospects, develop them, repay itself for all outlays made, and then pocket the lion's share of the remainder for having done so.

What is wanted of capital is to take hold of the large propositions, and those involving great amounts of money, to stimulate and create confidence in the industry, and to put coin in circulation. We, of lesser means, will then be able to handle the smaller affairs, and we will all of us be profoundly glad of the condition of things which enables us to do so, and for the opportunities aud possibilities left for us. If capital should absorb the industry, from the grass roots up, we smaller fry would be robbed of our birthright, and all the incentives to manly and persistent effort in our chosen line taken from us.

June 27th, '95. MINER TOO.

Mineral Land Inquiry at Sacramento.

To THE EDITOR: — Haviug just taken my medicine in a hearing as to the mineral character of lands at Sacramento, and seen the workings under which the inquiry is held, I think it will save other miners a great deal of disappointment and trouble if they know the procedure and go prepared. The citations published in the local papers appear to be for the miner as a Government witness, but this is not so, for he must pay the expenses of taking testimony at the rate of $5 for each witness, payable in advance, before he is recognized at all. He must also have an attorney, or he will be in the same fix with the majority of miners that went to Sacramento while I was there, and who virtually became witnesses for the railroad and against themselves, the railroad attorney kindly volunteering to act as attorney for both sides, as he put it, to bring out the facts in the case, about like this: There is some pasture land, some could be farmed, some would raise vegetables, some timber, and the land is generally mineral in character. Then a short discourse on the goodness of the railroad company to the miner, the fairness they have again shown, and the unwarranted attacks of the newspapers and politicians. That finishes his case, and so on until a fight is made for some piece valuable for mining, and where the miner is not satisfied to prove the general mineral character but intends the specific mineral character of a certain piece of land shall be demonstrated once for all, then we have a different procedure; we find the railroad secretary has made a special trip to that part of the country, has gathered willing tools to swear to anything, and if they can't swear away the shafts, tunnels and mining machinery in evidence they will swear they are on some other subdivision and not on the land in question, thus making it almost absolutely necessary for the miner to have an official survey made, and to take a surveyor with him as witness.

Would it not be a good idea for some of the miners' association funds to be expended for a lawyer to be in attendance at the land office, and not let the old miners, who go to Sacramento to save from confiscation the properties they have worked a lifetime, be made the laughing stock and tools of the company?

As to what railroad witnesses will swear to, I can give you the following sample: One piece of land in dispute was lot 6 of section 17, adjoining the town of Ophir. The ground covered by mining claim is mined out. A steam boiler is on the ground. A perpendicular shaft ninety feet deep is in plain view from the county road, as are also twenty or thirty other dumps of mining shafts, sunk during a period of thirty-five years. Yet, four witnesses swore positively that there never had been any mining done on lot 6; the fifth one weakened and acknowledged there was a hole in the ground—he didn't know but it was a cellar. One witness, George Betterle, a laborer living near by, even swore the mine in question had never paid and was worked out, and if it had he would have known it. He was also able to swear the adjoining mine (Eclipse), with a U. S. patent, had never paid anything, and if it had he would have known it, when it is notorious that some of the richest ore in the camp has been taken out of these mines, some of the waste dump paying $68 a ton, and which facts are known by everybody in camp.

Ophir, Placer Co., Cal., June 24, '95. O. T. W.

The Pelton System of Power.

Fourteen years ago L. A. Pelton, a resident of Nevada county, invented and put upon the market what is now familiarly known as the "Pelton Water Wheel." This, like all great inventions, was so simple an affair that the wonder is it had not been thought of before, and yet four years of study and experimenting were required to develop and perfect it. Little was thougbt at that time of the important part this was to play in the mining and industrial development of the Pacific coast, as well as the country at large, in future years.

The Pelton wheel was first brought into prominence by a test at the Idabo mine in Grass Valley in 1884, at which all the prominent wheels then in use in this State were represented. The Pelton showed by brake test an efficiency of 87 per cent—a result now generally obtained and sometimes exceeded in practical work—and was immediately adopted by that company, twelve of them being installed at that time and four more a year later. These sixteen wheels have been running in connection witb the mine and works of that company during all this time without stoppage and with practically no expense in tbe way of repair or loss of efficiency.

Since then these wheels have been sent to almost every country on the globe—more than 6000 being now in operation, running under beads varying from 12 up to 2100 feet, and aggregating some 400,000-H. P. It is quite within bounds to say that tbis is one of the most useful as well as illustrious inventions this country has ever produced, making possible the utilization of this great, natural, native force under all conditions and for every variety of service, with a useful effect never before obtained and in so simple a way that machinery may be said to be almost dispensed with.

In a series of papers under the heading of "American Supremacy in Applied Mechanics," Dr. Coleman Sellers, one of tbe most noted engineers of this country, makes the following statement:

"One of tbe most noted instances of the practical solution of a mechanical problem is given in the development of the Pelton water wheel, a system worked out entirely by and through experimentation.

"Results have been achieved by these improvements on wheels that were among the earliest used, so that the history of the Peltou wheel is typically American, and stands as a monument of human ingenuity, meeting the definition that has been given of mechanical engineering—common sense applied to practice."

Prof. Thos. Egleston, of Columbia College, an eminent hydraulic engineer, in a recent communication, says: "I have bad occasion several times to recommend the Pelton wheels in the most earnest way and to bring them to the attention of engineers, as I believe them to be the best wheels at present in use."

Many similar statements from the highest recognized authorities on hydraulic engineering in this country, as well as in Europe, could be given, but your readers are too familiar with the practical side of this question to need any further reference.

There has been much theorizing of late about regulation in connection with water wheels operating electric generators, and, by inference, an assumption that complete success has not been attained in this way. The Pelton Water Wheel Co. do not refer to what *may be done but what has been done*, and, in verification of this statement, offer some such substantial evidence as the following. The President of the Standard Mining Co., of Bodie, says:

"Of our differential governor I cannot speak too highly. It is quick acting, sensitive and in every way reliable, and can be depended upon to take care of any changes of load that may occur at the motor end of the transmission—13 miles away. The one drawback to the use of water power for running electrical machinery—heretofore considered insurmountable—has been the want of a governor that could be relied upon to take care of the sudden variations of load constantly occurring, more particularly when used for power purposes.

"This want you have supplied in so satisfactory a way as to leave nothing to be desired."

The President of the Redlands Electric Light and Power Co., running an 800 H. P. plant, makes the following reference to their governing appliance:

Your differential governors afford absolute control of the wheels and maintain a uniform speed on the generators under all variations of load even with the extreme changes caused by starting and stopping the 150-horse power synchronous motor at the ice house 4 miles away. The regulating device is simply perfect and meets the most exacting requirements of electrical service.

The Weaverville Electric Light Co., referring to the matter of regulation, report as follows:

The power plant furnished by you for this Company is perfect in all its appointments and has given perfect satisfaction to all concerned. The wheel works to a high degree of efficiency and the regulation afforded by your differential governor is all that could be desired. The lights are perfectly steady under all variations of load, in fact, the plant runs itself, only one man being required in the power house. BLAKE & GIVEN.

A large number of additional references of similar character can be given, bearing upon this subject, which, it will be conceded, carry more weight than conjecture or theory.

San Francisco, June 26, '95. GEO. J. HENRY, JR.

The Union Gas Engine Company of San Francisco, Cal.

The illustrations in this issue of the PRESS give some idea of a few of the extensive uses to which the gas engines manufactured by the Union Gas Engine Company of San Francisco, Cal., are being applied. In view of the economy, practicability and efficiency of the Union engines, as attested by the fact that over sixteen hundred are in daily operation on this coast alone, besides the large number used in the East, a brief sketch of the origin and rapid progress of these pioneer manufacturers of gasoline engines will be of interest: Less than six years ago two small machine shops, one at 230 Fremont St. and another at 213 First St., in this city, respectively under the management of John F. Daly and Daniel S. Regan, began to build and place upon the market gas engines in which the explosion was effected within the cylinder by means of an electric spark. Though the practicability of this principle was regarded with some degree of doubt, even by mechanical engineers and men who had experimented with the older types of gas engines, there were still many who had faith in its success, and the engine with tbe sparking device rapidly grew in favor. In the meantime a company had been organized by John F. Daly, under the title of the "Pacific Gas Engine Company," and another by Daniel S. Regan, called the "Regan Vapor Engine Co." As Messrs. Daly and Regan had at one time been associated in experiments along these lines, quite naturally their engines had some points in common. This fact led to litigation tbat bid fair to seriously retard the success of both companies. After some stubborn figbting the two companies wisely decided to consolidate, which they did May 16, 1892, incorporating under the name of the "Union Gas Engine Co.," with a capital stock of $300,000. Being thus enabled to unite and preserve the best features of both engines, the result was what might have been looked for—a high-grade motive power, compact, durable and efficient. The new company, under the management of J. F. Daly, proceeded to enlarge and refit the plant at Nos. 221 and 223 First street, where it continued for two years or more to manufacture and turn out a large number of engines adapted to every purpose for which motors ranging from 1 to 80 H. P. are required. The business having now outgrown its limited quarters, tbe company decided to erect a specially designed building, with every convenience for construction that past experience and ingenuity could suggest.

Its new home—the present two-story brick structure—has 50 feet frontage by 150 feet in depth at 309 and 311 Howard street. The interior is arranged upon tbe "Gantry" system, the second floor being practically a broad gallery extending across the front and back the entire length of both sides, leaving the first floor open to the light from the skylight which runs the length of the roof. Ranged along both sides of this long, light well are the lathes, drills, planers and other appliances for conducting the work in hand. Between the galleries is a traveling crane by which tbe heavy work is handled with comparative ease. The front end of the gallery is occupied by a handsome suite of offices, drafting room, etc., while the front of the first floor is shared by a large show room and an arched driveway for tbe entrance of heavy trucks. From forty to fifty skilled men are constantly employed; the monthly pay-roll being $2500 to $3000.

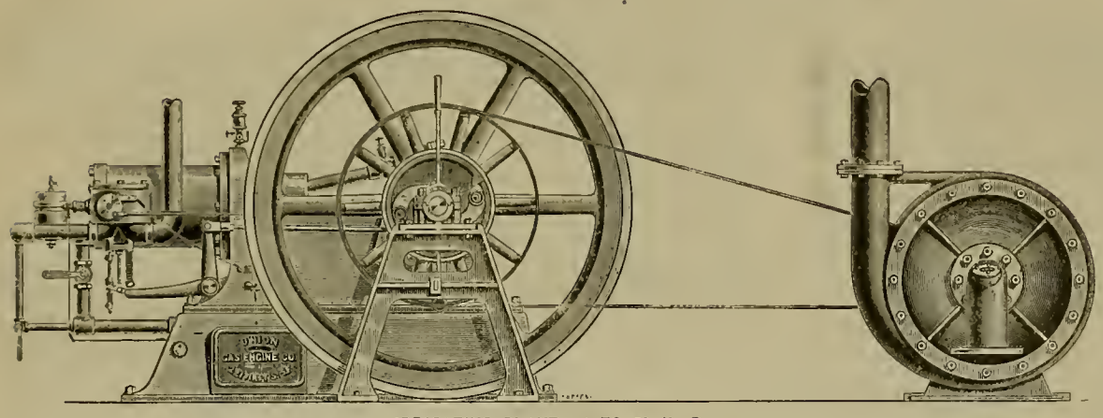
In addition to the home factory, this company has established large works in Philadelphia—the "Globe Gas Engine Co.," under the management of W. J. Casey, formerly of San Francisco, and one of the original incorporators. This move was made necessary in order to meet, with facility, the increasing demand for the "Union" engines in the Atlantic States. It has ever been the policy of the company not to allow pains, expense nor prejudice to stand in tbe way of needed improvements in bringing the "Union" engines up to tbeir present high stage of perfection. Recognizing the growing demand for a simple and economical propelling power for light pleasure craft, the company has given special attention to this branch of its business. The result is a marine engine, simple and safe to operate, compact and graceful in design. To this has been recently added a new form of reverse gear, through which, by the movement of a single lever, without noise or jar, a boat may be driven ahead, held steady or backed with perfect ease. This is an important feature, as the many devices for the purpose that have been invented and discarded clearly indicate. This same mechanism is also applicable to tbe mine-hoisting machinery which the company manufactures. The "Union Marine Gas Engines" are now propelling boats on many waters, the craft ranging in size from launches not much larger than a skiff to freight and passenger boats of many tons burden. Quite a number of yachts and coasting schooners are also provided with "Union" engines of from 10 to 100 H. P. as an auxiliary aid to sails in time of calms or storms.

FIGURE 2 on the first page shows the "Santa Monica," a passenger boat plying between San Pedro and Catalina Island, some 25 miles off the coast of southern California. Her length is 48 feet, beam 12 feet. She is fitted with a 20-H. P. "Union" marine engine, and made the run from San Francisco down the coast, a distance of 417 miles, in 41 hours. FIG. 3, "Yolo Belle," is owned by a firm in Sacramento, Cal., and carries freight and passengers on the river. Her length is 48 feet; beam, 10 feet; engine, 20-H. P.; average speed, 10 miles per hour in good water. FIG. 4 is a flat-bottomed stern-wheeler, light draught, for use on Eel river and Humboldt bay, Humboldt county, California, where she has been in service about three years, giving entire satisfaction—propelled by a 15-H. P. "Union" gas engine. FIG. 5 shows the latest double-cylinder type of the "Union" marine gas engine, with improved reverse gear attached.

Besides the marine type the company builds both vertical and horizontal patterns, adapted to operating pumps for irrigation, machine shops, dairy plants, hoisting works for mines, quartz mills, electric lighting plants, etc.

It is but a few years since prejudice placed such limitation of capacity upon tbese engines as to quite debar them from competition with steam beyond certain very light work. As an illustration of how this feeling is giving way before practical demonstration: a few weeks ago the "Union" Company built and shipped to the Sterling Mining and Milling Company, of Payrump, Nye county, Nevada, a 25-H. P. hoisting plant of its own special design. In May the Sterling Company ordered another 25-H. P. hoisting plant, one 40-H. P. engine for stamp mill and one 40-H. P. engine for a "Huntington" roller mill, aggregating 130-H. P., still further exemplifying the extending limit of capacity of these engines. There is in course of construction by the "Union" gas engine works an 80-H. P. marine engine of special design, to be placed in the magnificent palace yacht now being built for the young California millionaire, Charles L. Fair. This engine is to be accompanied by a 6-H. P. auxiliary, which will be used as a starter for the large motor, and also to run a dynamo for lighting and heating. The new craft will be 96 feet on the water line and 18 feet beam, fitted throughout in the most thorough manner, as it is calculated to weather seas in any part of the world. While the rapid and almost phenomenal success of the "Union Gas Engine Company" is largely due to tbe recognized merit of the work it turns out, still an important factor in its progress has also been the untiring enterprise, ingenuity and business ability of its officers—John F. Daly, president and manager; H. P. Coles, secretary and treasurer. Cheerful response will doubtless be made to those who wish to obtain more detailed information in regard to the "Union Gas Engine."

Union Gas Engine Co.



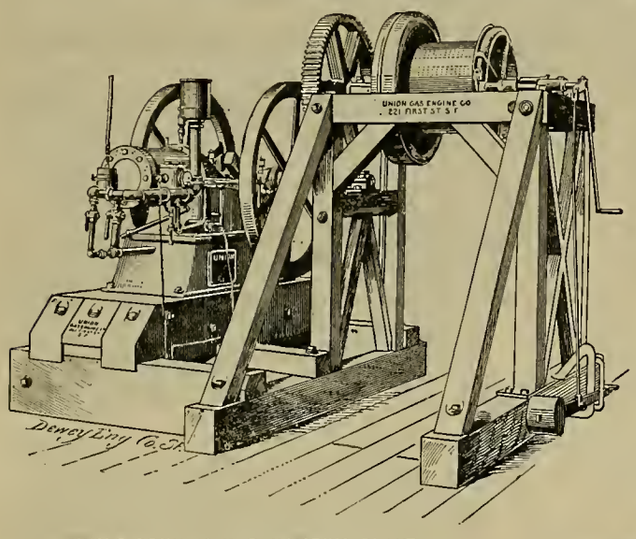
IRRIGATING PLANT—4 TO 50 H. P.

Pioneer Manufacturers

Of Gasoline Engines, and Owners of 20 Patents on same.

COURTLAND, April 9th, 1893.

UNION GAS ENGINE CO., San Francisco, Cal.—Gentlemen: I write to tell you how my "Union" Engine is working. The first day I got it I put it to pumping water to drain my ranch from rain and seepage water. My engine, an 8 H. P., and a No. 6 centrifugal pump, I started at 9 A. M., and it ran all day without stopping. At 10 P. M. I filled the oil cups and went to bed, and never went near it until 7 o'clock in the morning, and it was running along as smoothly as when I left it the night before. The plant had no shed or cover whatever, and was out on the side of the levee a quarter of a mile from the house. After that I started it and ran 46 hours without stopping. Had it coupled to a tank holding 110 gallons gasoline. All I did was to oil the pump, and fill the oil cups morning, noon and night, and stay away from it all the rest of the time. Now I have been away five miles from home, having my horse shod; was away from my ranch about six hours, and no one near the plant, and when I came home the plant was working as smoothly as when I left. The pump throws about 75,000 gallons an hour. Taking the plant as a whole it is a wonderful one, running on less than 15 cents an hour, requiring no engineer, and no attention whatever but supplying with gasoline and oil. I have had experience with another kind of gas engine, and can cheerfully recommend your engine and pump to any one as a safe, simple, economical and in every way satisfactory plant. Most sincerely yours, ERNEST A. GAMMON.



SINGLE DRUM 12 H. P. HOISTING PLANT,
On Keystone Mine, Lincoln, Nevada.

KEYSTONE MINE, LINCOLN, NEVADA,
Feb. 20, 1894.

GENTLEMEN:—I wish to inform you that I recently set up one of your 12 H. P. Gasoline Hoisting Plants for the mine, and was greatly pleased with the operation of same. Must say that I never saw a finer working piece of machinery than this hoist. It started at once, and we never had a hitch in the two months I operated it. The incline is about 40 degrees, and we hoisted a load of about 1800 lbs. at a speed of 200 ft. per minute, and at a cost so cheap that it astonished us, and we concluded to make an accurate test in order to ascertain the exact cost, so that there would be no mistake. The oil was carefully measured and we made a run of 112 hours on 30 gallons of gasoline. This test was witnessed by the manager of the mine, and he will indorse this statement.

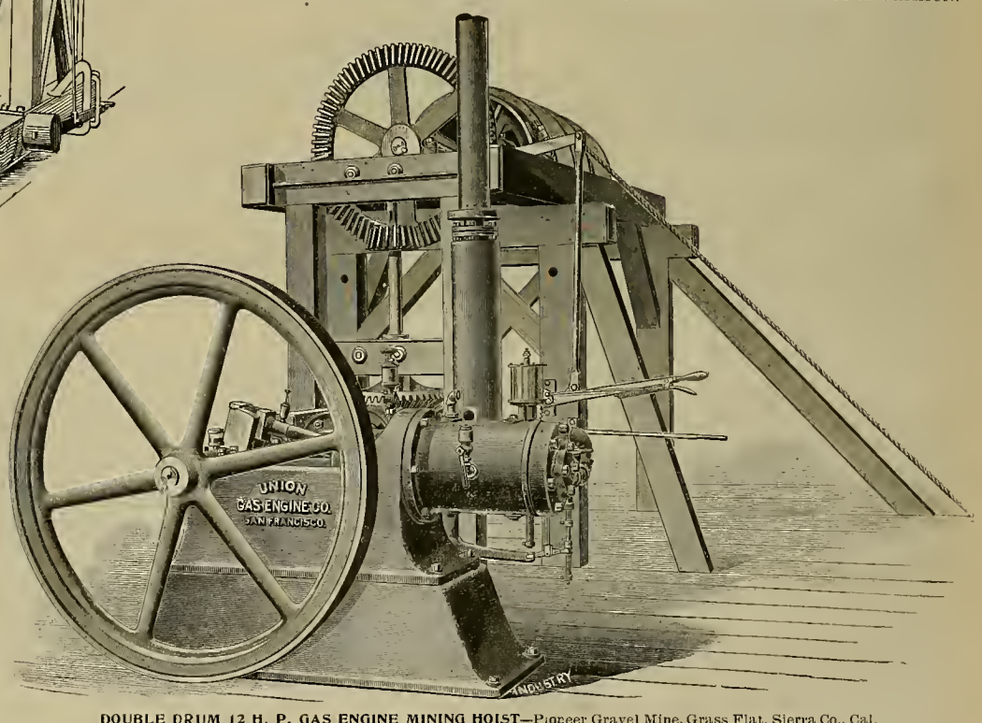
You can refer to me at any time, and I will be glad to speak a good word for your engines, for I am satisfied that when they are better understood by mining men, you will supply more mines. JAS. S. MURCHIE,
Mining Engineer.

The cut opposite is of a special form of hoisting plant as used in the Pioneer Gravel Mine, at Port Wine, near Grass Flat, Sierra county, Cal.

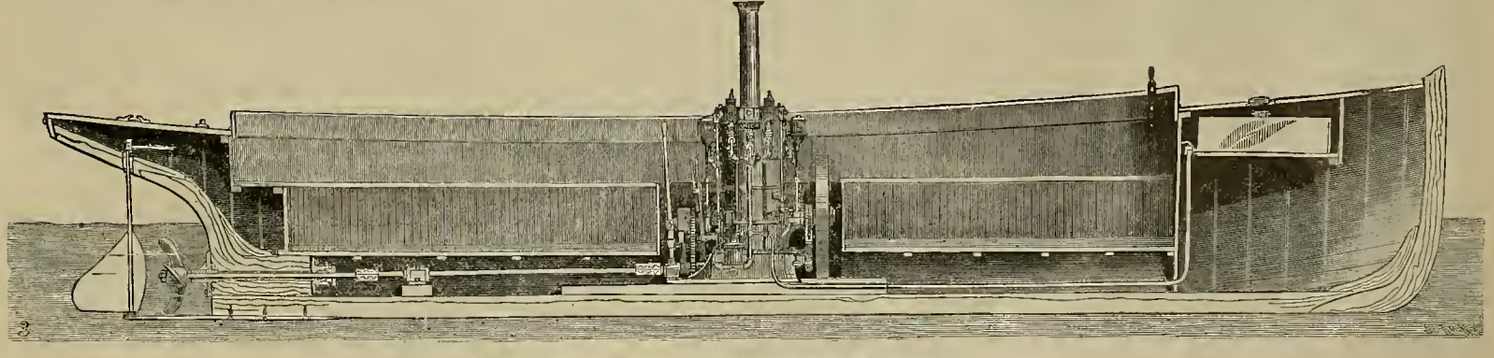
GRASS FLAT, SIERRA CO., CAL., Nov. 25, 1893.

UNION GAS ENGINE CO.—Gentleman: Since last July we have used one of your 12 H. P. Horizontal Gasoline Engines for hoisting and pumping. Our incline commences 1400 feet from the mouth of our tunnel, descending 150 feet with a one-foot-in-four grade. We use about 8 H. P. to pump 6000 gallons 33 feet an hour, and at the same time raise cars each holding about 3500 pounds of gravel. The tunnel is the usual-sized, single-track mining tunnel. The incline is double.

We hoist about 350 carloads each 24 hours. To do so it is only necessary to run the engine between five and six hours a day. We do some hoisting each hour, but when the engine is not actually running all expense as to fuel is cut off. With steam we would have to keep up a full head all the time, and an engineer at his post, not to mention the danger of explosions, and the consequent filling of the works with scalding steam and coal gases. Yours truly,
J. F. COWDERY,
325 Montgomery St., San Francisco, Cal.
CHAS. S. DEISEM, Superintendent of the mine.



DOUBLE DRUM 12 H. P. GAS ENGINE MINING HOIST—Pioneer Gravel Mine, Grass Flat, Sierra Co., Cal.



SECTION SHOWING UNION GASOLINE ENGINE IN OPEN LAUNCH.

UNION GAS ENGINE CO., 309-311 Howard St., San Francisco, California, U.S.A.

Illustrated Catalogues will be mailed wherever required.

Gold and Silver Product of '94.

The annual Government report of the mineral resources of the United States for the calendar year 1894, compiled under the supervision of Dr. D. T. Day, Chief of the Mineral Department of the Geological Survey, is based on reports of experts and special agents. The total product shows a decline from the output of 1893.

The total product was valued at $524,955,131. The total value of non-metallic mineral products was $305,786,343; metallic, $218,168,788, and unspecified mineral products estimated at $11,000,000.

The official result of the investigation of the metallic products for the year are as follows, arranged by quantity and value:

Pig iron, 6,657,388 long tons, $65,007,247 valuation.
Silver, 49,501,122 troy ounces, $64,000,000.
Gold, 1,190,816 troy ounces, $39,500,000.
Copper, 360,244,218 pounds, $33,141,142.
Lead, 159,331 short tous, $9,942,254.
Zinc, 75,328 short tons, $5,288,026.
Quicksilver, 30,416 flasks, $934,000.
Aluminum, 550,000 pounds, $316,250.
Antimony, 200 short tons, $36,000.
Nickel, 9,616 pounds, $3269.
Platinum, 100 troy ounces, $600.

The non-metallic miueral productions are the following:

Bituminous coal, 118,820,405 short tons, $107,653,501.
Building stone, $37,092,102.
Petroleum, 49,521,757 barrels, $35,800,532.
Natural gas, $12,000,000.
Clay (all except potters'), $9,000,000.
Cement, 360,000 barrels, $800,000.
Mineral water, 8,362,245 barrels sold, $5,030,081.
Phosphate rock, 21,569,608, $3,742,846.
Salt, 967,059 barrels, $3,395,988.
Limestone for iron flux, 11,683,703 long tons, $4,455,171.
Zinc, white, 3,368,350 short tons, $1,894,275.
Potters' clay, 21,443 long tons, $1,500,975.
Gypsum, 239,312 short tons, $761,719.
Borax, 14,680,130 pounds, $974,445.
Mineral paints, 4,192 short tons, $498,093.
Grindstones, $223,214.
Asphaltum, 60,570 short tons, $353,400.
Precious stones, $132,250.
Pyrites, 105,940 long tons, $363,134.
Corundum, 1495 short tons, $95,936.
Manganese ores, 6308 long tous, $53,635.
Sulphur, 500 short tons, $20,000.

The report says pig iron production decreased from 7,124,502 long tons to 6,657,388, and the valuation decreased nearly $20,000,000.

The gold product for the year is the largest since 1878, increasing from 1,739,081 troy ounces for 1893, with a coining value of $35,950,000. Silver production declined over 10,000,000 ounces. The rapidly increasing zinc product was checked in 1893 and 1894, and a slight decline noted iu both years. The exhaustion of the Virginia pockets of ore caused a decline in the mauganese product, which was less than half the output in 1892. The nickel product was reduced to one-fifth of the 1893 output, and antimony valuation decreased $9000. The product came from Nevada and was smelted in this city.

The petroleum export was the largest yet recorded—over 100,000,000 gallons more than in 1893. The value of rough gems decreased from $264,041 in 1893 to $132,250 in 1894. The mica industry is still supplied by irregularity in mining methods, and mineral waters declined over $500,000 in value,

It will be interesting to readers of the MINING AND SCIENTIFIC PRESS, who take interest therein, to note that the United States, according to Mr. Preston's reports, stands third in the list of gold-producing countries. Mr. Preston is usually a very careful statistician, and if he sends out a report over his official siguature it is only after comparison. According to his report, which is too long to be published in detail, the yield of gold in Australasia during the calendar year 1894 was 62,856 kilograms, valued at $41,760,800; in South Africa, 60,707 kilograms, worth $40,346,000, and in the United States 59,434 kilograms, worth $39,500,000, placing this country below Australasia and South Africa in the gold yield of '94.

Without disputing the accuracy of Mr. Preston's figures, it may be said that the Australiau Department of Miues in their report, just to haud, officially give the Australasian product for '94 a total value less than that accorded it in our Mint Director's report, aggregating $35,786,426, at an average fineness of 825.

While the Director of the U. S. Mint should be an authority on fineness of gold, it is possible that allowing a higher figure for the average fineness of gold in Australasia than the facts will be found to warrant has occasioned the apparent superiority in aggregate gold yield in Australasia, and that the same thing will affect the final returns of South African gold values.

The world's annual gold yield is a difficult aggregate to procure, but without caviliug with Mr. Preston's figures it may be said that his announcement in this regard is not accepted as definitely conclusive.

Robinson Gold Mining Company's Report.

The following from the general manager's report of one of the leading South African mines is interesting as illustrative of their methods and results:

Mine—Quartz milled, 9215 tons. Development—Drives, 549 feet; raises, 385 feet; crosscuts, 225 feet; shoots, 27 feet—total, 1186 feet. Main incline shaft west: Fifth level—Raises, 53 feet. Sixth level—Driving west on south reef, 23 feet; raises 32 feet; crosscuts, 70 fect. Seventh level—Driving east and west on main reef, 84 feet; raises, 30 feet. Eighth level—Driving east on main reef, 41 feet; raises, 34 feet. Ninth level—Driving east and west on main reef, 63 feet; main crosscut, 38 feet. Tenth level—Driving west on main reef, 30 feet; raises, 8 feet; shoots, 16 feet; crosscut, 39 feet. Main incline shaft east: Fifth level—Driving east on main reef, 24 feet. Sixth level—Driving west on main reef, 45 feet; driving west on south reef, 21 feet; crosscuts, 15 feet. Seventh level—Driving west and east on main reef, 42 feet; driving east on south reef, 48 feet; raises, 112 feet; crosscuts, 9 feet. Eighth level—Driving east on main reef, 42 feet; raises, 90 feet. Ninth level—Driving east on main reef, 59 feet; main crosscuts, 32 feet. Tenth level—Driviug east on main reef, 27 feet; raises, 87 feet; main crosscuts, 22 feet—total, 1186 feet. Mill—Stamps at work, 70; net running time, 28½ days; tons crushed, 9215; tons per stamp per diem, 4.4; gold won from above, 8789 ouuces 5 dwts. Chlorination and cyanide works—Gold won from own concentrates by chlorination, 1203 ounces; bullion from tailings (cyanide process), 2011 ounces 15 dwts. From own ore, 12,004 ounces. Gold from concentrates purchased (by chlorination), 2092 ounces 18 dwts. Total, 14,096 ounces 18 dwts.

EXPENDITURE AND REVENUE.
(Crushed, 9215 tons.)

WORKING EXPENDITURE.		Cost per ton
Mining account, including mine maintenance	£ 7,490 3 0	£0 16 3.08
Milling account, including mill maintenance	1,875 11 7	0 4 0.85
General maintenance account	135 10 0	0 0 3.53
General charges	1,161 14 2	0 2 6.77
	£10,682 18 9	£1 3 2.23
Expenditure on mine development, including main shaft	3,679 9 9	0 7 11.83
Expenditure on machinery, plant and buildings	935 2 0	0 2 0.35
	£15,297 10 6	£1 13 2.41
Retreatment account:		
Working expenses at cyanide and chlorination works	2,076 3 2	
Cost of concentrates purchased, including receiving	6,460 14 3	
		£23,834 7 11
Profit for month		29,004 10 0
		£52,838 17 11

REVENUE.		
Gold account (mill), 8789 ounces 5 dwts.	£31,641 6 0	
Sundry revenue	800 0 0	
		£32,441 6 0
Retreatment account:		
Gold account (tailings), 2011 ounces 15 dwts	£ 6,669 5 0	
Gold account (own and purchased concentrates), 3295 ounces 18 dwts	13,595 12 0	
		20,264 17 0
Plus amount received in excess of book entry for February gold		132 14 11
		£52,838 17 11

The sum of £11,108 7s 7d was expended on account of mill extension during the month.

In a recent lecture on the use of aluminum in vessel construction, Mr. Yarrow, the noted English shipbuilder, said that the two great enemies of the metal are heat and alkalies. The metal anneals at a comparatively low temperature, thus losing strength, while alkalies act very rapidly upon it. Consequently any part liable to be subject to a considerable rise of temperature should not be made of aluminum, nor should it be used for a condenser where soda may be required for cleaning purposes. Aluminum at high temperatures oxidizes with exceptional rapidity. At low temperatures it does not oxidize so rapidly, and the film of oxide on the surface protects the metal from further action.

Professor Carl Myers of Frankfort, N. Y., has begun supplying ocean vessels with balloon outfits. A tank containing the materials for generating hydrogen gas, to inflate the bag, is provided with the necessary fittings and cork. It is believed that the same wind which sends a ship ashore can be made to carry a line to life-savers on the beach.

During the meeting of the American Institute of Electrical Engineers at Niagara Falls this week, the formal starting of the great plant of the Niagara Falls Power Company will occur. At present only one of the 5000 horse power dynamos is in place, ready to supply local customers, but work on two more of them is in progress.

Over 84,330,800 barrels of petroleum were produced in 1894. These figures cover the total production of the world. Of this amount the United States produced 57 per cent and Russia 40 per cent. In 1859 the total production of the United States was only 2000 barrels.

Electric lamps of one-candle power, operated by a storage battery weighing 2½ pounds, and good for ten hours without recharging, are among the latest novelties. The battery is about six inches high and two inches square.

Mining in Old Mexico.

Mining in Mexico is not in a depressed condition because of the low price of silver. This particular industry is prosperous there. The peso or dollar and onza Mexicana is now, and always was, on its equality or standard ratio of $1.21 to one ounce. The peso or onza buys as much there to-day of all the necessaries of life as it always did, and the man in Mexico who works out his silver mine has never felt or known that silver has dropped in value. On the contrary, he has been largely benefited by the drop in silver, as most mines contain in addition gold and other metals which are always paid for according to the gold standard; that is, for his silver he in turn receives his silver in dollars, and there can be no loss while for his gold he receives to-day from $36 to $38 per ounce in silver.

Under the new Mexican law miuing is especially encouraged. The preliminary denouncement of a mine costs from $15 to $25 and requiries publication in the official paper of the capital of the State for ninety consecutive days. At the end, if the party desires a patent, he pays the federal treasury $10 for each pentenencia 325 feet square; hereafter an annual tax is demanded of $10 per pentenencia, and uo further obligation or work is required. Prices vary from responsible positions at $4 per day to $1.25, which, when the capital comes in gold from the outside and is exchanged into Mexican silver, makes it doubly cheap. Hundreds of mines in Mexico are paying handsome dividends, which in the States could not be worked at all under the present silver depression.

The famous Candelaria mine, which has paid its successive owners in the course of 200 years over $150,000,000, is now working on ore which pans only $25 to $28 per ton. The San Dimas district, in which the Candelaria is situated, is said to be the richest in Mexico. Most of the large mines there are iu the hands of Americans. The Candelaria, owned by D. M. Burns and Clarence Matertiame of this city, a group of mines belonging to the Hearst-Haggin Co.; the Coronado property of J. N. E. Wilson, and the Promontores, an old mine recently acquired by F. M. Ochoa and other San Franciscans. All these mines, except the latter, are low grades of free milling gold ores, while the Promoutores hardly goes ten per cent above the others. It is the present advantage of exchange and cheap labor which more than anything else makes those profitable.

Silver-Lead Ore Sampling.

Sealed proposals are invited by the Secretary of the Treasury for the sampling and assaying of lead ores imported into the United States under the provisions of the tariff act. This act imposes a duty of three-fourths of one cent per pound on the lead contained in silver-lead ores, aud under its provisions it is necessary that facilities for sampling and assaying shall be provided, at the expense of the party receiving the contract, at each of the ports at which silver-lead ores are imported. The method of sampling and assaying such ores is to be the same as that usually adopted for commercial purposes by public sampling works in the United States, and the bidder must stand under oath for the facilities under their control for performing the service, and the method in detail which they propose to use. The right is reserved to reject any or all bids, and to award the contract to one bidder for all the work, or to accept separate bids for the general ports at which ores are imported.

Some useful products from what may be termed a novel source are enumerated by the *Revue Scientifique*, as showing the ingenuity and diversification of modern industry, and the value of that bandit of the sea, the shark. Thus the liver of this predatory creature is fouud to contain an oil of a beautiful color, which never becomes turbid, and possesses medicinal qualities of a very valuable character; the skin, after being dried, takes the polish and hardness of mother of pearl, and on being marbled bears a resemblance to fossil coral, so that it is employed by jewelers for the manufacture of fancy objects, by binders for making shagreen, and by cabiuet makers for polishing wood; the fins, independent of use by some as an article of food, are superior for conversion into fish glue, competing in this line with the well-known sturgeon glue prepared in Russia, and are used for clarifying beer, wine and other liquors, also for the preparation of English taffetas, and as reagents in chemistry, etc.; the flesh, too, despite its oily taste, is in some places eaten as food.

The first manufacturing establishment at a distance from Niagara to contract with the power company for electricity from the great cataract is the Plumb, Burdict & Barnard Bolt and Nut Works of North Tonawanda, twelve miles away. This company will use about 200 horse power, applied through sixteen motors.

To be constantly quoted is certainly a sure sign of successful newspaper work. It means that the best judge of a newspaper, the exchange editor, is passing his favorable opinion.—The Fourth Estate.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MIDDLE BAR BOOMING.—*Dispatch*: J. L. Henry of Montana and six others came to Middle Bar last Sunday to begin work on the mine purchased from Richard Vorlander a week before for $4000—$500 paid down in cash at Wells-Fargo's office in Mokelumne Hill and the $4000 to be paid in six months, by December 1st. They have also bought the rest of the land and ranch, except the orchard and vineyard where Mr. Vorlander lives, for which in one year they pay $3000 more cash down, making $7000 in all. In ten days or two weeks they will have on the ground an engine, pump and complete blacksmith shop, also build a dwelling house, sleeping house, carpenter shop, and stable on the ground and sink a shaft on the west side of Jackass Gulch, just above the tunnel of the Hancock mine, and will prospect the mine thoroughly with this shaft and if it proves rich enough will increase their force, machinery, mill, etc.

The Hancock mine will add another shift of men up in the upper tunnel on the North end of the claim where they first began working some months ago.

BUTTE DISTRICT.—*Republican*: James Morgan, who some years ago spent about $30,000 in trying to prospect the Butte basin has sold that property to a company of Oakland capitalists who propose to prospect the property. They intend to drive a tunnel into the basin from the gulch near the road to Big Bar between 1000 and 1700 feet to drain the basin, so it can be worked. The immense volume of water which is accumulated there has prevented the working of the property in the past and, with a tunnel 1000 feet long, the basin will be tapped about 130 feet from the surface. Additional depth can then be drained by a siphon carried lower down the canyon and the pay dirt can be sluiced out with the water of the tunnel.

Calaveras.

ANGELS MINES.—*From our Travelling Correspondent*: At no time in the past has there been the activity now displayed in prospecting for quartz mines in the vicinity of Angels. The most promising feature is the fact that this work is being done by capitalists or incorporated companies possessed of sufficient capital to carry the work through. The fact that the land is now held by ranchers has not discouraged these investors for instead of buying feet they have bonded whole ranches, thus securing all the veins on the ground at a nominal cost, and the territory in all directions is still large enough to employ millions of capital with every promise of good returns. On the east is the Star of India, then the Turner and Gold Valley, next the Gold Valley No. 2, Blair, Eclipse and Gold Hill. Then follows a wide belt covered by ranches on which the Magog is being opened, on to the east is the Madison, Gold Cliff, Suffolk, next the Johnnie Meyers, then the Utica belt with the Fritz, Bovee, Angels, Lightner, Utica, Stickle and Last Chance; west the Dead Horse and Drake and Tryon, then a stretch of ranches with the Birney on the east. This is all on a direct line from west to east and covers a distance of over three miles. Between these mines are vein after vein crops, and while the work on all of these mines is not sufficient, as yet, to determine their value the mother lode zone at Angels is easily three miles in width. Thus far about all of the work has been confined to a strip about a mile wide across the zone. North and south there stretches mile after mile of country with just enough work done to show that the veins are there and carry gold in paying quantity. As Angels is but 1400 feet above sea level, mining operations can be conducted throughout the year, which fact, coupled with the low rate of miners' wages, cost of supplies and water makes it a very promising field for mining.

The Utica Co.—T. T. Lane, superintendent: As usual the company is "saying nothing and sawing wood." They now have in operation the Utica, Stickle and Madison mills, while operating through the Stickle the adjoining Dead Horse mine. Lately they have bonded the Last Chance, which is the extension of the Stickle to the south, and are putting down a three-compartment shaft, with Walter Tryon in charge.

At the Madison, which is about 3000 feet west, N. Williams, the foreman in charge, has the shaft now down 960 feet. In the shaft the quality of the ore is now not only good but increasing in value in depth. The Utica's mills are in charge of Mr. W. J. Loring, under whom the sixty stamps in the Utica, sixty in the Stickle and forty in the Madison mills pound out a steady stream of the yellow metal. Parallel with the Utica's Last Chance mine is the Drake & Tryon, E. Mattison superintendent. The shaft is now down 100 feet in the foot-wall, and they will now crosscut to the vein.

East of Angels the only mine opened is the Birney, which shows a good-sized body of heavily sulphuretted ore. South, Mr. Jas. Tullock, "Uncle Jim," is opening up the Tullock. He is now down 150 feet, with a sixteen-foot vein. Forty tons of rock worked in the arrastra gave $1640; but Uncle Jim does not have to depend upon his arrastra, as his hand-mortar will give him sufficient gold to keep things running. Uncle Jim claims $700 a ton for his sulphurets and $10,000 in the dump. Parallel with him is the Santa Anna, J. D. McCright superintendent. This mine is just being opened by Col. Shaughnessy, who, in his short shaft, is finding very satisfactory prospects. East, on the Utica vein, the O. K. is being opened by a crosscut by Mr. O. Rollar. On the south are the once famous mines of Carson. The old Morgan, with its great record of $3,000,000 from one cord of rock, sleeps. The old Melones, which joins it on the south, is being experted by L. Janin for Mr. W. C. Ralston. This mine was only mined out on the surface and only the gouge of the vein extracted then. On the Union, Kentucky and Iron Rock nothing is being done. The English company that have been operating south at Robinson Ferry have closed down after trying their two and a half miles on the mother lode in two places.

West—The Carson Creek mine, under M. D. Howell, has its shaft now down 625 feet and is dropping twenty of its forty stamps. To the west of the Utica, the Gold Cliff, under W. Garrard, is dropping its twenty stamps on ore from the open cut, with face eighty feet wide, and mining and milling for 65 cents a ton. Beyond this are ranches, now under bond, on ore of which the superintendent, T. E. Flagg, is opening up the Magog. His shaft shows an iron-stained body of ore, fifty feet wide and heavily sulphuretted. Beyond, to the west, is the Blair, J. J. Schmadake, superintendent, which is running nine and ten-stamp mill on its west vein. Just south is Gold Valley No. 2, with Mr. H. M. Ricketson as superintendent. He is sinking and is now down fifty-five feet, and states that his ore assays up to $26 a ton. West is the Turner, J. H. Roberts, superintendent. The vein has been opened by a crosscut and winze and shows about sixteen feet of good-looking ore. Mr. Roberts is erecting a hoist and preparing to "go down."

Just north and east of the Blair is the El Dorado, W. H. Bisbee, superintendent. The shaft is now down ninety-five feet, with the ore increasing in value. A hoist is now to be put on the property, and his neighbors all agree that "Bisbee has got a mine." North and west is the Eclipse, which adjoins the Blair on the north. Notwithstanding all statements to the contrary, that hard-headed old miner, T. E. Flagg, is superintendent. Their work has been on two veins between the El Dorado vein on the east and the Blair on the west, and on the same vein found in the Gold Hill mine to the west. When Mr. Flagg starts up this fall he has only to crosscut to get about all the veins in that section. West is the Gold Hill mine, S. V. Ryland, superintendent. This is the old "Osborn mine," famous in the past for its pockets. Mr. Ryland has opened up the Hill by drift and open cut, and from the eighty-foot wide ore body he obtained pan after pan of ore from every place that looked barren, and in every instance obtained very good prospects. Going down to the mill the mill man brought out a lot of rock that he had picked out that day, which was 10 to 50 per cent gold.

On a bench lay a slab of rock, saved from the rock breaker, that glistened all over with gold. Mr. Ryland don't claim to have a bonanza, but says "She'll do."

To the north of Angels the Fritz is arranging for a steam plant. The Fritz is just north of the old Bovee, which in early days was held at $5,000,000, and, in the language of one of the miners, "looked like a jewelry shop," and had an offer of $3,000,000 from the Rothschilds. Once this mine is given depth, Angels will have another Stickle. This brings the mines up to Altaville. Just north of Altaville Col. Shaughnessy has bonded the Baumhoffer Ranch, and has three shafts down. The Utica and Dead Horse veins course through this ground and on north through the ranches to San Andreas. West of Altaville, J. G. Divote, of the famous Bonanza mine of Sonora, has bonded the Cherokee, which in the past, yielded about $800,000 from surface pockets.

At Altaville, which is now a part of Angels, is located the Angels Iron Works, Demarest & Fullen proprietors. Mr. Fullen is Mr. Hayward's old master mechanic and is familiar with every detail of mining machinery, while Mr. Demarest is an engineer whose education is up to date. Their shops are full of work, having just completed Fullen ore and water skips with Fullen safeties for Hayward and Lane's Alaska mines, besides supplying their Alaska mills with their white iron dies.

They have built a power plant for the Argonaut mine of Amador county to go 2000 feet; a mill for the Dutch mine of Tuolumne county; sawmill for Hale's mills of Sonora, and are at work on a double reel hoist and air compressor for the Utica Company, and a machine, the first constructed, for the Gottschalk mine, which the inventor claims will cut out a drift the full width and depth as the machine is moved forward on the tracks. The working of this machine will be watched with interest.

Such, in brief, is "the mines of Angels" to day. Investors will not find paying mines for sale at nominal prices, but good territory can be secured in all directions, and in Angels, as elsewhere, on the Mother Lode, it is "go down, or go up." The poor miner is not "in it" in this section. Save to secure a location and show the width and character of the veins in it, the town itself might well be called Utica, as at this time about everything is owned and everyhody in some way is employed hy the Utica Company. The large number of mines now in course of development will soon change this condition, and once the mines are all running full-handed Angels will boom in a manner that will surprise its inhabitants and revolutionize the town and surrounding country.

E. H. SCHAEFFLE.

GENERAL ITEMS.—Calaveras Co. *Herald*: Demarest & Fullen are building some engines for the hoisting works of the Utica Company; also a mill-casting for the Utica Company's plant at Shingle Springs.

The Cherokee, near Altaville, is honded and will soon he in operation. It has a record of hundreds of thousands of dollars taken out, though worked only to a depth of 60 feet. This mine joins the Carley, on which work will commence in a few days. The Cherokee was sold for $75,000.

Humboldt.

THE METTAH MINE.—J. M. Donahue, H. B. Mayo, W. P. Ball and Chas. Hilton of this city are at Metta hon the Klamath river, inspecting the Mettah mine with intention to huy it.

Mr. Donahue will also look at the Klamath Bluff mine, owned by Mr. Perkins of San Francisco. This mine is known to be rich, but a good deal of money will be required to develop it.

Kern.

AMALIE MINING DISTRICT.—The Dull Brothers are taking out sulphite ore from the Mayflower. They have an eight-foot lead.

The Occidental Company have made a strike of sulphite ore in shafts Nos. 3 and 4. The ore has been a chloride hut has increased in richness with depth.

Messrs. Garbett and Stringham, of Los Angeles, are visiting the district.

Mariposa.

Gazette: The California Mines Co. is pushing work at its property, which ineludes the Daisy, Jubilee and Steveson quartz mines, located on the north side of the Merced river, below Benton Mills. A contract has been made with J. J. Brooks to furnish the company with 500,000 feet of lumher. He has erected a sawmill on Dates Flat, eight miles above Coulterville.

The company is arranging to throw a dam across the river some distance ahove the mines, from which point a large flume will be put in. This work will be followed by the erection of a mill of larger capacity.

A NEW MINING DEAL.—J. W. Snyder, C. C. Wallace and S. T. Gage, have bonded the Rollins mine, and men have been put to work. Material for retimbering the mine is being hauled. The mine was worked quite extensively in former years, and is known to be a good one.

Nevada.

THE CADMUS MINE.—*Transcript*: Adolph Weber, W. T. Smith, J. M. Harper and Charles Stepp, are inspecting the company's property on Deer creek below the Home mine. Recently while Supt. Kahl was building a ditch from the Home mine to the Cadmus he cut through a blind ledge a few feet below the surface, two and a half feet wide, the quartz being rich. A tunnel was then run into the hill sixty-five feet, forty feet further down towards the creek. The ledge was cut and the prospects obtained were of such a flattering character that it is the company's intention to sink a perpendicular shaft 300 feet, for the purpose of opening up and developing the ledge. Hoisting and pumping works capable of sinking 1500 feet will be erected without delay. This new ledge has been named the Odea, in honor of one of the stockholders.

THE BOSS MINE.—*Transcript*: H. W. Morris, the principal owner in the Boss mine, near Sweetland, has been over looking at the property and seeing how operations are progressing. He will return to San Francisco and arrange to send up more machinery, so that the capacity of the mill can be increased to twenty stamps. The mine is looking well, there is abundance of ore in sight and with facilities for handling larger quantities of it the property will pay handsomely.

Placer.

RED CEMENT GRAVEL.—*Messenger*: Bacon & Hannish have bonded forty acres adjoining the Baccarat and have extensive works in full operation. They have put up a Cox's pan, and engine and have about thirty men employed, working a day and night shift. Their dirt is of the red cement gravel order, located on the rim rock, hut which dips rapidly, and is fast running into the hlue clay, with increased richness as it dips. The cement vein is about four feet thick, lying on bedrock, which works readily in the pan. They are putting through an average of eighty tons every twenty-four hours, at a cost of about 95 cents a ton. The average yield has been $1.50 a ton, leaving a profit of 55 cents, or about $45 a day, which makes a good fair business.

Plumas.

THE PLUMAS IMPERIAL.—*National Bulletin*: C. D. Hazzard has hought Col. Day's interest in the Plumas Imperial mining property at Hungarian and Emigrant Hill.

Shasta.

GENERAL NOTES.—*Press*: Chas. Lane, of Hayward & Lane, Captain C. Tozier and D. Hunt, are visiting the mines in the vicinity of Trinity Center.

A rich strike was recently made in the Hart mine at Old Diggings, of a two-inch seam in the ledge, about one-half gold.

The Eureka Tellurium Gold Mining Company contemplates the erection of a Huntington mill on the Cleveland mine.

M. A. Delano, superintendent of the Washington mine near French Gulch, has men at work cleaning up the mine and mill.

Haskell & Co., of the Little Maud mine, are arranging for the completion of the lower tunnel and the full development of the mine.

The Eureka Tellurium gold mine started five stamps Monday morning, and are working the ore hy the Murdoff process. The mill will he run to its full capacity.

S. J. Johns, who was elected to succeed W. M. James as superintendent of the Uncle Sam mine, took charge of the property Tuesday. Mr. Johns is the son of Wm. Johns, superintendent for the syndicate of English capitalists who own the mine.

J. H. Beecher came up from Anderson on Wednesday and went out to his mine, on the Igo and Shasta road, to complete the steam arrastra which he recently set up. He was accompanied hy John Beaumont, who brought up a wagon-load of supplies, and an engineer who will superintend the machinery.

R. G. Hart shipped last Saturday, through the Bank of Shasta County to the refiners in San Francisco, a gold brick valued at $1850. This brick represents the result of two weeks' run, but does not represent the output of the mill, as the sulphurets are shipped to the smelters and the returns amount to about $12,000 per month.

Siskiyou.

GENERAL MINING NOTES.—*Journal*: A package containing an even hundred pounds of gold was brought to Yreka last week by W. P. Bennett, lately cleaned up from his mines at Forks of Salmon, estmated to be worth $20,000. A San Francisco company has offered him $100,000 for his claim, half down on delivery and the balance in six months, which offer has been refused.

The hydraulic mines at Oro Fino are now in full hlast, with an ahundance of water to keep piping day and night continually. The prospects seem favorable for the largest yield ever realized at that camp, which contains the finest gold in Siskiyou, and the cause of that camp being named Oro Fino, or fine gold.

Cartwright & Phillips are now running a lower tunnel to strike their lower ledge deeper down at Humbug creek, and feel confident of realizing good pay. In the upper tunnel the ledge ranged from two to four feet thick and showed excellent prospects, this lower tunnel having been made for the purpose of working the claim to better advantage.

The pumping plant at Shasta river for the Espey, Hunter Milling Co. is expected to be ready for operation by the 4th of July, and the pipe up the hill is now being laid with a large force of men at work. As soon as the pump is started the flume will be kept full of water for supplying the giants in sluicing down the banks near Hawkinsville.

H. D. Wright, who has an extensive hydraulic claim at Oro Fino, is taking out a great amount of gold dust at present, keeping his giants steadily at work day and night. The hot sun is melting the snow at a rapid rate, and if the continued hot weather prevails the water supply may run out within a couple of months, as the fountain soon dries when the snow is all gone. He is piping very rich ground at present, with 12 hands employed, and expects a richer yield this season than for many years past.

Shasta.

GENERAL MINING NOTES.—*Searchlight*: The mineral belt about French Gulch attracts attention. C. N. Tozier has succeeded in getting a bond on the New Brunswick mine near the Tower House for $40,000. C. D. Lane and others are interested in the property and development work has begun. "If the vein proves to be continuous in depth and of equal value to surface ores, it will be a large producer," said Mr. Tozier, and "we will expend all the money necessary to prove the property. We will begin at once to run a tunnel which will strike the vein at a depth of 200 feet below the present superficial workings. Our orders are in already for tools and materials, and the work will be pushed to a finish."

The Bell group of mines consisting of the "Black Bear" Golden Eagle and Sunset mines has been bonded to C. A. Hascall. Ore has been shipped to Selby to an extent of five tons and over and the result has been from $300 to $600 per ton. These properties lie on the summit of Muletown mountain.

Sierra.

THE ALASKA MINE.—A sale of this mine in Sierra county was recently reported. But the transaction did not go through. The *Herald* says: It was decided to close down, and on Wednesday a deputy sheriff came over from Downieville with an order of court to seize what amalgam might be cleaned up in the mill, to cover the claim of a merchant who attached the mine. The company owed the men for wages, however, and the superintendent advised the men to resist the officer and appropriate the amalgam themselves, to cover their wages. They did so, and six of them were arrested. They were admitted to hail in the sum of $100 each.

NEVADA.

AT SILVER CITY.—*Enterprise*: Ore is being extracted from the Northern Belle mine in Silver City which is of fair grade, and a dump has been erected to facilitate work.

A run of ahout 100 tons of ore from the Oest mine, worked in the Pollard mill recently, yielded a little over $50 per ton.

ALASKA.

GENERAL MINING NOTES.—*Record*: Lutes & Runkle expect to start their mill up on ore from the Bennett mine this week. They have twenty-four men at work taking out ore.

At the Horrible mine, in the Berners Bay district, owned by F. Bach, a drive of seventy feet shows up a four-foot vein the ore from which assays $16 to the ton. The vein is exposed 1300 feet up the mountain.

F. C. Mayon, superintendent of the Alaska Commercial Co's forty-stamp mill at Unga, keeps the forty stamps running on ore of an excellent grade.

After the sudden death, last fall, of Mr. Hahn, of Hamburg, who organized the Alaska United Gold Mining Company, for the purpose of erecting a two-hundred-stamp mill on the Ready Bullion claim, adjoining the Treadwell mine, Mr. E. De Crano, of Belgium, one of the principal stockholders, took up the work and had arrangements nearly all completed when he, too, suddenly died. His estate is now heing adjusted, and until this is completed nothing will he known of the company's future intentions. Mr. Duncan, superintendent of the A. T. G. M. Co., had reported favorably on the mine, and had it not heen for the death of these two men there would have heen another two-hundred-stamp mill running within sight of Juneau. At the time of Mr. De Crano's death Fraser & Chalmers, of Chicago, were making an estimate on the cost of the machinery.

At Seward City, the Berners Bay Mill and Mining company's twenty stamps are running steadily, and the company will have to send

up more miners preparatory to starting up the forty stamps.

ARIZONA.

GENERAL NOTES.—*Ortiz*: Negotiations are going on for the sale of the Lincoln mine on Lynx creek, Yavapai county. This mine is owned by Prescott men.

Near Ehrenberg work on the Arica mine is going on steadily and as the shafts go down the ore body grows larger. Active development work on this property will be continued.

Thos. Ewing and associates have bonded from Charles Baghy and others a group of gold mines in Hassayampa district, Yavapai county, and will at once begin work and develop the mines in a thorough manner.

Fifty thousand pounds of machinery are now on the ground at the Bull Dog mine, at Goldfields, besides large quantities of lumber. Another carload of lumber is being sent up this week. Work will commence on the twenty stamp mill at once.

In Mohave county Wm. Bohne and Ole Ingelbretsen, who have a contract of running a 50-foot tunnel on the Nighthawk mine, have encountered an eight-inch vein of ruby silver ore after running only fourteen feet. The ore is fabulously rich, running over $18,000 to the ton.

The Ark mine, in Mohave county, is now putting out large quantities of the richest ore ever struck in that property. The drift that was run for the ore chute, found above, is now all in ore. The mill will commence grinding in a few days and shipments of concentrates will again be in order.

THE GILA MONSTER.—Another stamp mill is on the way for the Gila Monster mine, sixteen miles north of Phœnix, Arizona.

THE DESERT MINE.—The Desert mine, fifteen miles west of Harrisburg, recently purchased by Eastern capitalists for $10,000, is being actively operated. The machinery is on the way for a twenty-stamp mill, which will be increased to forty stamps shortly.

THE SHUT-DOWN IN THE FRISCO.—There were about 100 men at work on the Frisco, and 70 of these have been discharged, leaving 30 men, or thereabouts, at work, says the Wallace *Miner*. Of these only 10 men are employed in the mine in addition to a few shovelers. The remainder are working on the surface getting ready for the new hoist and air compressor. All the work at present in progress in the mine is drifting on the lower level and raising from the same. They are grading and otherwise preparing for the large air compressor plant, which has been ordered, but it is not expected here for about two months yet. Manager McDonald states that it is very indefinite when they will resume full operations again.

At Globe, on Tuesday evening of last week a notice was posted at the Old Dominion mine which informed the employees that the mine had shut down until further notice. More than this we are not informed. The pump men have been retained. There is at present no employment for miners at Globe, and the streets are filled with idle men.

COLORADO.

THE C. O. D. MINE SOLD.—The last payment on the C. O. D. mine, at Cripple Creek is made. The property is now owned entirely by the Frenchmen, who have already taken charge. Of the amount paid, $110,000 was due July 1, and $120,000 October 1, but interest at the rate of four per cent per annum was reckoned and discount allowed. H. Leonard will manage the mine. By the sale P. E. Bourke will receive $75,000 and the heirs of J. S. Troy an equal amount. Charles L. Tutt will receive $60,000, and Spencer and Penrose and Capt. Steadman will each receive $50,000.

IDAHO.

MINING COMPANY ORGANIZED. — *World:* Joseph Voshay returned last Sunday from New York and went over to Placerville yesterday. He succeeded in forming a syndicate of wealthy men in New York City to carry on mining operations in this county. The company was capitalized at $1,000,000—500,000 shares at $2 each. Mr. Voshay will be the representative of the company in this country for three years, and will examine mines, secure options with the privilege of developing and report to the company. The Directors of the company are Thurston, Lunsberry and Sims. When options are secured Mr. Thurston will come out and examine the properties. The company will send out money to Mr. Voshay as it is needed for development. The first claims to be developed are Golden Chariot and King Hill, on King Hill, at the head of Ophir creek, near Placerville. Gerard Huppertz has been engaged to take charge of the work.

THE BUNKER HILL AND SULLIVAN.—A Wardner dispatch reports ten additional men put to work in the Bunker Hill and Sullivan. There has been no interference by the miners' union, and the leaders of that organization declare there will be none. They say they rest their case upon the claim that good miners cannot be had for the wages offered by the company, $3 a day, and that under no circumstances will any act of theirs be allowed to precipitate a conflict. Manager Bradley says now that the company has started the work it will go ahead regardless of what action the union may take.

There are new arrivals of men every day seeking work at the Bunker Hill and Sullivan mine. The company is ready to receive all applicants now who want work as miners. Manager Bradley has about completed his working staff. George A. Sonneman has been selected as superintendent, with William J. Twentyman as general foreman. Frederick Burbridge, who has acted as assayer for the company for nearly two years, has been appointed superintendent of the mill. Herring and Williamson are to be shift bosses in the mill. Charles Simmons will soon return from this city to resume his old position as bookkeeper.

THE LAST CHANCE.—It is considered probable that the Last Chance mine will resume. It is stated upon apparently good authority that the injunction placed upon the Last Chance Company in the famous case of the Tyler Mining Company vs. the Last Chance Mining Company will be raised and that the Last Chance people will immediately put on from 80 to 100 men in the mine and 10 or 15 in the mill. The Last Chance, before it got into litigation with the Tyler Company, was one of Wardner's chief supports.

PROSPECTING IN ORO FINO HILLS.—The hills and gulches of the Oro Fino, which yielded quantities of gold in the early '60's, are again being torn up in every direction. Five hundred men, it is estimated, are wandering through the timber, carrying pick, shovel and pan, and each day brings from ten to twenty more. From all over the northwest they are coming, old miner, tenderfoot and every grade between. The boy who was raised on the farm and never slept a week away from under the parental roof, camps side by side with the man who made his stake in Idaho in the '60's or in California in the '50's.

MONTANA.

THE GEORGIA.—A strike has been made in the Georgia mine, near Landusky. The Georgia lies near the Big Chief, and was purchased as a prospect by Spalding last fall for $150. Spalding has refused $15,000 for his interest in the mine. The owners have been engaged in sinking a shaft for several weeks, and at a depth of 27 feet struck a vein which now shows a width of 25 feet. The lead is located in porphyry, and the ore from the bottom of the shaft runs from $25 to $150 in gold.

OREGON.

THE BEEKMAN AND HUFFER MINE.—*Tidings*: J. H. Huffer went to San Francisco on Tuesday to make arrangements for securing a stamp mill to set up at the Beekman & Huffer bonanza on Jackson creek, near Jacksonville. This claim continues to yield handsomely with a hand mortar, a $600 slug being realized last week, and the owners think that, with a three or five stamp mill, they can work some of the less rich ore with profit. The ledge is a wide one of some fourteen feet, with rich pockets.

THE BOHEMIA MINE.—There were sent twenty-five pounds of gold to the Mint here last week from the Bohemia mine, and will return over $5000. This is the largest run for one month yet made, and that with a small mill.

SOLD TO A SALT LAKE MAN.—The Cove and Golden Gate quartz mines in the Sparta district have been sold by George Shindler and O. S. Buckland to F. W. Muhlenbonch of Salt Lake.

SOUTH DAKOTA.

THE LUCKY CUSS.—A Huron, S. D., dispatch says: The Lucky Cuss mine has struck a vein carrying from $10 to $25 of gold per ton, and another vein which carries from $50 to $500 per ton, and is four feet wide.

WASHINGTON.

MINES AND MILLS ABOUT LOOMIS.—The Chopacca Mining and Milling Company have miners at work upon their tunnel and expect to reach the main ledge next week.

Superintendent O. S. Stocker of the Black Bear Mining Company has a force of men doing assessment work on the company's group of five mines, and has started the quartz mill.

The Triune mill recently cleaned up $2,700 in bullion, the result of ten day's run on ore from the Triune mine.

PROBABLY EXAGGERATED.—Geo. Early, foreman and acting superintendent of the Rainier mine, owned by the Negro Creek Nickel and Copper Mining Company, near Leavenworth, makes a report that sounds big. He says the cross-cut tunnel on this property has been driven to a depth of 150 feet, and a double shift is still taking out ore. In all this distance the tunnel shows large veins of ore, the largest one being 37 feet and 6 inches in width. This huge vein has just been passed through and a few feet of gangue matter encountered. This, too, has been removed by dynamite, pick and shovel, and still another vein of ore shows up. Six feet of this has been passed through. Mr. Early thinks he will run fifty feet yet before striking the upper wall, which will make the cross tunnel 200 feet in length. He also expects that the gangue matter will give entirely away as the wall is approached, and that the remainder of the distance will be through solid ore. If this proves to be the case, there will be fully 155 feet of the tunnel running through ore. As the tunnel runs at right angles with the ledge, this would yet leave a ledge of 100 feet of ore. He calculates that a vertical depth of 100 feet has been attained. On the surface the ledge appears to be about sixty feet wide.

J. B. McLaren of Wannacut Lake Mining Company, whose properties are in Golden, has put on a force of men to a 200-foot tunnel on the Standard claim.

THE Edward P. Allis Co., of Milwaukee, Wis., has been awarded the contract of the Carnegie Steel Co., of Pittsburg, for building seven vertical compound duplex condensing blowing engines having 40x60 high pressure, 78x60 low pressure and 76x60 blowing cylinders for their Duquesne steel works.

Sampling Works for Sale.

The works are situated at Daggett, Cal., in the Calico Mining District, and on side track of the Atlantic & Pacific Railroad. They contain a first-class 50-horse power Engine and 45-horse power Boiler, with Ore-crusher and other machinery, Mill Scales, Assaying Outfit, etc., all nearly new. Also upon the premises an office building and a comfortable dwelling-house (portable). The above can be had at a bargain. Apply to JOHN H. GILLESPY, 1906 Stockton St., San Francisco.

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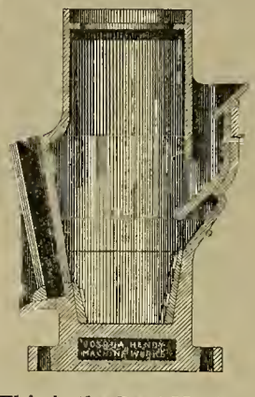

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Scientific Progress.

Some Vestigial Structures in Man.

By W. E. ROTZELL, M. D., Narberth, Pa., in *Hahnemannian Monthly.*

The term vestigial is used in anatomy as being more convenient in describing those parts generally known as rudimentary, aborative, atrophied, or useless. There are many vestigial structures in man, and an attempt to more than mention some of the most interesting of them far exceed the limits of this article.

The appendix vermiformis is a vestigial structure, and, like all such structures, has no function to perform in the organism. "Not only is it useless," says Darwin, "but it is sometimes the cause of death."

The vermiform appendix is, doubtless, the remains of the much elongated caecum that is found in the majority of the herbivorous mammals. The usefulness of the tonsils is also doubtful. They are, as we all know, frequently the seat of disease, and after removal the individual realizes no inconvenience from the loss. Of what utility are the cervical auricles that occasionally occur in man, or the supernumerary legs, fingers, and toes, as well as all the other abnormalitities that frequently occur ?

Among the lower animals there are numerous instances of useless organs, such as the clavicle of the cat, the teeth of a whale, or the sting of a bee or wasp, which when used, as a rule, causes the death of its owner. Referring to insects, Professor Graber says: "There are also numerous structures and organs which may, with absolute certainty, be pointed to as perfectly useless." "But seeing that so enormous a uumber of specific peculiarities are in the same predicament, it surely becomes the reverse of reasonable so to pin our faith to natural selection as to conclude that all these peculiarities must be useful, whether or not we can perceive their utility. For by doing this we are but reasoning in a circle. The only evidence we have of natural selection is furnished by the observed utility of innumerable structures and instincts which, for the most part, are generic, family, or higher order of taxonomic value. Therefore, unless we reason in a circle, it is not competent to argue that the apparently useless structures and instincts of specific value are due to some kind of utility which we are unable to perceive."

The third molars, or wisdom teeth, are becoming vestigial in civilized man. These teeth are now, as a rule, the last to come and the first to disappear; they are smaller and more variable than the other molars and have only two separate fangs.

The body of adult man is always more or less covered with hair; this hair is the remains of the more extensive hairy covering possessed by his ancestors. An interesting fact in relation to this hairy covering is that the hair on the arm and forearm is directed toward the elbow—a characteristic which occurs only in the anthropoid apes and the American monkeys. The explanation of this has been given by Wallace who states that the orang, when resting, holds its long arms upward over its head, so that the rain flows down both the arm and forearm to the long hair which meets at the elbow. In accordance with this principle, the hair is always longer or more dense along the spine, often rising into a crest of hair or bristle on the ridge of the back. In the entire series of the mammalia, from the monotremata to the quadrumana, this character is very prominent.

It is a well known fact in embryology, that at about the sixth month the human fœtus is frequently covered with rather long dark hair over the entire body, except the soles of the feet and the palms of the hands. This covering of hair is shed before birth, and so it is apparently useless except as being an evidence of evolution.

Other vestigial structures are the muscles of the external ear, and the panniculus carnosis, subcutaneous muscles by which a large number of the mammalia are able to freely move their skin, thus protecting themselves from insects. The plica semilunaris, or nictitating membrane, the semitransparent eyelid, is rudimentary in man and other mammals, while in the other members of the vertebrata the function of this structure is to sweep over the external surface of the eye, apparently to keep the surface clear.

The bones of man present such vestigial peculiarities as the supracondyloid foramen, which occasionally occurs; it is normal in the lower quadrumana. There is also the intercondyloid foramen, which occurs in man and the anthropoid apes, but is not constant in either. These peculiarities are found to be more common in the bones of the ancient races of mankind, and also in some savage races.

The anatomy of man presents a large number of vestigial structures, each of which throws some light on the long line of his ancestral history, and that can only be accounted for as explained by evolution.

A New Alloy.

The *Engineer* describes a new alloy, said to justify its right to be called new by possessing qualities not previously found in any of the bronzes. It is called Melloid, and may be described as a malleable bronze. It is a mixture of copper and tin, which is entirely free from zinc, aluminum or iron, and it differs from phosphor bronze, manganese bronze or Bull's metal in being tough and ductile at all temperatures. Many descriptions of brass and bronze can be forged or welded, but Mr. Bull, the inventor, states that with all of them there is a temperature at which they become brittle. This may vary from 400° to 900° Fahr.; and when it is passed, they again become tenacious and malleable if their temperature be raised still higher.

AN ACCOUNT of the sinking of wells in granite and other crystalline rocks, where water is not generally supposed to exist, has been given to the Paris Academy of Science by M. Nordenskiold. Certain pilot and lighthouse stations in Sweden have been troubled by the lack of a suitable water supply. From the fact that water had been found in deep boreholes on rocky islets, Nordenskiold concluded that temperature changes produce shearing stresses between surface rock and that lower down, forming horizontal fissures into which water must percolate from the surface. It was believed that this water would be fresh, as the water reaching from mines extending far under the sea is never saline. Acting on this theory, a well was last year sunk in the island of Arko to a depth of 100 feet below sea level, when a horizontal fissure was encountered, from which was obtained a daily supply of 4400 gallons of perfectly fresh water. Similar wells in other localities yielded water at a depth of 110 to 120 feet. The rock in each case was granite, gneiss or diorite, and the wells—2½ inches in diameter—were bored by diamond drills.

A COMPETITION has recently been opened by the Societe Industrielle de Rouen, France, for an improved pyrometer. The new apparatus is to be portable and capable of indicating temperatures of over 300° C. The prize takes the form of the gold medal of the society, and all competitive material is to reach the president of the society before September 2d, 1895.

THE attempt has been made by Mr. Moisan to produce argon compounds with some of the substances that unite more or less readily with nitrogen. Titanium, boron aud lithium remained unchanged in the new gas under various conditions, as did also uranium and even the intensely active fluorine.

A DETERMINATION by Prof. Barnard with the Lick telescope places the diameter of Neptune at 32,900 miles—from two thousand to four thousand miles less than is stated in most text books.

Mechanical Progress.

Bilge Keels on Big Warships.

A ship's keel has several functions. It gives the hull a backbone, and hence longitudinal stiffness. It also offers resistance to any tendency to slip sideways through the water, this quality depending upon the flat area afforded by either side of the keel. And finally, such a surface must to some extent put a check upon rolling. Although that was not the prime purpose of a keel, the idea occurred to some bright shipbuilder a few years ago that if one kneel would do good in this particular direction, two keels might possibly do more. When the experiment was tried, these were placed one on each side, and as far apart as they could be, and yet remain on what could be considered the vessel's bottom. So gratifying were the results attained that other constructors followed the example; and the idea also found favor among yacht builders. There can be no doubt that such a keel enablcs a sailing vessel to stand up better to the wind with a stiff breeze thau does the old single keel.

But naval experts had misgivings about the utility of the system for great war vessels. Not only were bilge keels bothersome in docking a vessel for cleaning and repairs, but there was much scepticism as to reducing the roll of great heavy ironclads thereby; and it seemed probable that the increased friction might retard a ship's speed. By degrees, however, the idea was extended to cruisers of moderate size. In some cases, four kneels were used, two on a side. The appeudages were 144 feet in length, and not over nine or ten inches in depth; yet they were found efficacious. There was especial hesitation about putting such keels on the great battleships of the Royal Sovereign class, each of which had a tonnage exceeding 14,000. It seemed more than ever doubtful that any appreciable effect would be felt by such enormous craft. Finally, however, two of them, the Repulse and the Revenge, were thus equipped, and tests made in company with the Resolution, a vessel of the same size and qualities. Bilge keels never exteud quite from bow to stern, but taper off before reaching either extremity. John Bull's Director of Naval Construction, Sir William White, told some naval architects in London the other day a little about the result of these tests.

On one occasion, when the Resolution had a roll which sent her twenty-three degrees out of plumb, and the Royal Sovereign and the Princess of India even further, the Repulse never had a greater inclination to the vertical than eleven degrees. At another time, in a storm, when the Resolution swung sixteen or eighteen degrees each way, the Repulse would go only six or eight. In the experiments made with the Revenge in still water, the whole crew set the vessel a-rolling by rushing suddenly from one side of the deck to the other. Before the bilge keels were applied about forty or fifty natural swings were necessary to bring the vessel back to a certain specified degree of repose, after getting her over at an angle of only six degrees; but after the addition of the keels, the swing was extinguished with eight oscillations. Again, by suddenly shifting her barbette guns, the Revenge could be rolled to an angle of thirteen degrees before the keels were applied; and afterward only six or eight, even with 300 or 400 men running across the decks to enhance the effect of the guns.

TO OBVIATE the odor of oil and gas engine exhausts a deodorizing attachment has been brought out in France, a simple device which promises good result. Its principal action depends upon the absorbing proprieties of bone-black, or the affinity which this substance has for certain other substances, among them the objectionable components of the combustion gases from oil engines. The bone-black, is made to exercise a double effect,—acting by absorption as well as in a mechanical way, by filtration. The apparatus consists of a box, divided into two compartments by a perforated partition on which the bone-black is spread in a moderately thick layer. The exhaust gases from the engine enter into the lower compartment at the extreme left, pass through the perforated dividing wall and superimposed layer of absorbent into the upper compartment, and thence escape into the open air through the pipe at the upper right-hand side. The ammonia and fetid hydrocarbon gases are absorbed by the bone-black, and whatever liquid offensive particles may be in the products of combustiou are retained by it mechanically. Water of condensation, which collects the lower compartment, may be drained off through a drip pipe.

The Forge and Furnace of the Future.

The opinion is expressed by a mechanic that the forge and furnace of the future will consist of a lead-lined glass or porcelain vase, or cupola, filled with cold acidified water, to which is connected a strong positive conductor, the forge outfit being rendered complete by a pair of tongs with insulated handles attached to a flexible negative conductor. According to this plan, says the *Scientific Machinist*, the smith seizes the piece of iron which is to be manipulated with the insulated tongs, and plunges it into the sour water, which begins to boil and bubble the instant it comes in contact with the iron, the latter, in a remarkably short space of time, turning to a red and then to a white heat, ready for the work of the smith. So rapidly, indeed, is the heating done by this means that the water and the portion of the iron not immersed in the water are but slightly warmed. The principle involved in this process is of a simple and well known character—resistance producing the light and heat—it being found that enormous heat can be produced by such a method; much greater, in fact, than is necessary to extract iron from the most refractory ores. It is remarked that the value of such a process will be especially exhibited in the more complete and rapid handling of heavy iron and steel plates and bars requiring to be hammered and welded—more valuable still for tempering purposes, as the necessary heat for the immersed portion can be so quickly obtained, while the remaining portion holds comparatively cool.

Comparison of Engine Performance.

From reports of the performances of engines in electric stations the coal consumption per kilowatt hour for various types of engines enable comparisous to be made as to whether the decreased consumption of more expensive machinery will compensate for the increase of investment, while the economy curves of various types of engines running at different loads serve to indicate the size of units to adopt. Small units fall off very rapidly in efficiency with light loads, but large engines of the more highly efficient types may be worked through a great range with little loss—a compound condensing engine represented, for instance, showing an increase of less than a half-pound of water per H. P. hour between the limits of 750 and 2200 H. P., and a 500 H. P. engine of the same type but one pound between 200 and 500 H. P. Another notable point in regard to this efficient type is that the ratio of water consumption between the larger and smaller units is much smaller than with less efficient types. For instance, four units of 500 H. P. each would, if worked near their rated capacity, show an economy corresponding to less than three pounds of water per H. P. hour more than a large engine worked between 500 aud 1800 H. P. In this case, should the load vary from less than 500 H. P. to the maximum, the smaller units directly connected would probably be most efficient through the reduction of losses beyond the engine.

Electrical Progress.

Electrical Fires.

Inspector McDeavitt of Philadelphia has given to a Fire Underwriters' association his ideas on the increasing use of electricity as a fire question, especially in view of the general introduction of the trolley motor, and also the tendency toward complete electrical equipment in modern dwellings. Whenever a fire breaks out the origin of which cannot be traced, the blame is almost invariably put upon electricity. Mr. McDeavitt thinks that more often than not this conjecture is soundly based, and he shows how easily electric fires may be started, and how readily they may by proper care be placed almost beyond the region of possibilities. In most electric fires the primary reason of ignition has been the lack of precaution and unscientific installation. Nothing but skilled labor should be employed in the wiring of buildings, and the use of materials of the highest standard of quality is imperative. It is dangerous to enclose the bulb of an incandescent lamp with any material, even a fabric as light as mosquito netting. The prevalent fashion of shading the light with paper is safe so long as the paper is kept at a sufficient distance from the light; but if it approaches too near, charring takes place and then the heat ordinarily thrown off will cause ignition. Another common cause of fire is carelessness in setting up. The ends of the two wires that lead to a light are composed of of filaments of smaller copper wire, put in contact with the lamp itself by being wound around binding screws and then fastened down. If any of the finer wires escape the notice of the workman and become separated from the main bundle, contact with the metal shell of the socket will cause a "short-circuit," and should the fixture happen to be bound or draped with any decorating fabric, ignition is almost sure to take place. Mr. McDeavitt shows how a fire can be started by a live wire "grounding" with a gas pipe. One pipe in his possession is particularly noteworthy from the fact that it had been eaten through by electric current which had passed along streams of dripping water. About seven inches of the pipe had been pitted through by the action of the intermittent sparking, and the consequence was that the gas had escaped and ignited. Mr. McDeavitt says that the "bugbear" of electric wiring is the pendant cord. The great danger of flexible cords is through their brittleness and rough handling by people who do not know how to treat portable lights. These should always be moved with great care and contact of any frayed ends with the wire that completes the circuit should be avoided.

A Spiral Wall Socket.

Heretofore when brackets or electric fittings have been fixed to brick or plaster walls it has been necessary to drill a hole in the wall with a chisel, plug this with wood and then use the latter as the support for the object intended to be fixed to the wall. A ready avoidance of this troublesome and disfiguring method is now possible. Spirals of metal, in different sizes, are embedded in the wall when the plaster is being applied. When the wall is finished the spiral is firmly held in position and can easily be cleaned out. It then forms a socket in to which a bracket or fitting can be easily screwed and held firmly. This plan saves the walls, carpets and ceilings, and makes the adjustment of any kind of fittings a simple matter.

THE Pittsburg *Times* is authority for the statement that the contract for the electrical equipment of the Manhattan Elevated Railway of New York has been awarded to the Westinghouse Electric Company of Pittsburg. It covers between $6,000,000 and $7,000,000. Manager Hain, of the Manhattan, is quoted as follows: "Electricity is the power of the future in our business, and we must keep up with the times. The contract for that work has been given to the Westinghouse Electric Company. It will involve between six and seven million dollars' worth of electrical apparatus. It will not mean a change in our roadway, but will give us a much cheaper system of operation than that in use at present." Locomotives of 200-horse power will be used and the cars will be heated and lighted by electricity.

Electric Trolley Freight Cars.

A new departure is about to be made by an influential railway company which will be watched with the greatest interest by every railroad corporation in the country. The company proposes not only to install electric passenger cars on many of the "feeders" to its trunk lines, which, at present are run by steam, but to place in regular use a service of electric freight cars especially built for the transportation of grain. The cars are to be lighter than the ordinary freight cars, but much more durable. Each car will carry a set of buckets, by which the loading will be done electrically. It is proposed by means of these cars to make the work of shipping and unshipping much less tedious and expensive than it is at present. The cars can be backed into an elevator switch, and be handled without any trouble or delay. A well-known railroad magnate prophesies that within two years nearly all the grain from the great grain belt of the Northwest will be carried into Minneapolis, its center, by electric trolley

An Electrical Waiter.

There are few people who have not at some time or other looked forward to the advent of the electrical waiter, which, on the pressure of a button, would deliver to the customer sitting at a restaurant table any particular dish that might be specified by suitably arranged signals. The possibilities of electricity are so infinite that it is hard to conceive any application of it that may not sooner or later come into practice. At all events the Utopian idea of an electrical waiter has become a reality. One of the features proposed for the next year's exhibition at Amsterdam, Holland, is an electrical restaurant. The guests are to be served automatically with an elaborate dinner of many courses on pushing a button. A switchboard fashioned in the semblance of a menu card is fixed by the side of each guest, and is connected to the switchboard in the kitchen. Here the order is received. The edibles and drinkables are all placed in little cars, which run on a circular track on the table, and are duly delivered at their appointed destination.

For Telephone Receivers.

A hand attachment has been devised for neutralizing the disagreeable sounds produced in the telephone by induction, and the buzzing and clucking sounds that so commonly interfere with distinctness of hearing. This device is made of pure, soft gum rubber, fitted into a metal rim that springs or clamps over the end of any telephone receiver. This cushion regulates the distance from the diaphragm to the ear drum, and is said to improve the hearing 50 per cent, besides cutting out all extraneous noise. The cushion is large enough to entirely enclose the ear, and thus gives, practically, the advantage of a sound-proof booth.

ELECTRICITY has been rated as a dutiable article by the Canadian Comptroller of Customs. The question arose in connection with importing it into Canada for power and lighting purposes from the plant of the Niagara Falls Hydraulic Power and Manufacturing Co. The Comptroller decides that it comes under the head of unenumerated articles and must pay 20% duty.

AN electric railroad company in Philadelphia took in $11,400 on Memorial day. On Saturday and Sunday after Memorial day the receipts were $10,600 more this year than they were for corresponding days last year.

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The Secor System of Propulsion.

Notable as is the loss of energy which occurs between the coal-bin and final work-performing appliance in any ordinary steam plant on land, there is even more need of economy in power production on board ships that carry their own means of propulsion. The enormous space occupied by the necessary machinery and store of fuel reduce the capacity for freight and passengers, and constitute a large part of the burdeu to be moved; and the first cost of outfit and the expense of operation impose still other taxes on the commerce for which a steamship is employed. The idea of burning petroleum instead of coal uuder a vessel's boiler, although practiced in only an experimental way thus far, has this great recommendation: Only about half as much fuel, by weight, is required for a given voyage as when coal is used, and hence a larger cargo of remunerative freight may be carried. A much more radical improvement in the same direction is contemplated by John A. Secor, of Brooklyn, N. Y., who has for eleven years beeu experimenting with a system of propulsion peculiarly his own. Preparations for a public test in the near future call fresh atteution to his plan.

Mr. Secor says he can do away entirely with the steam engine and boiler, with screws and shafting, and uses comparatively inexpensive aud compact apparatus. Thus one great source of expense is eliminated and valuable space is gained. His substitute for the old mechanism is a stout, cannon-like cylinder, lying lengthwise in the vessel below the water level, well aft, and opening asteru. From this cylinder he fires at frequent intervals explosive charges of air and gas, mixed in about the proportion of 9 to 1. The gas is manufactured, as in a gasoline or oil engine, only as used, and the material therefor is carried in suitable tanks, that occupy less room than a vessel's coal-bunkers. Ignition may be effected by any of the several means employed with a gas engine; and the products of combustion by kicking against the water shove the boat forward just as a rocket is driven upward by the discharge of powder-generated gases from its lower end. In a vessel 100 feet in length Mr. Secor has experimented with a cylinder measuring 10 feet in length and 18 inches in diameter. In a 25-foot launch he has tried one in which the corresponding dimensions are 3 feet and 5 inches. But in a big ocean liner he says it would be better to have several, perhaps twenty or thirty firing tubes; and he deems it possible to use water gas or producer gas, instead of gasoline or oil. According to his estimate, the material for developing ten-horse power for ten hours could be inclosed in a single cubic foot of space.

Mr. Secor's great claim is that he applies his power so directly as to get a much higher efficiency than is afforded by any other known system. Even with the best steam engines there is a waste. Only part of the energy latent in the fuel gets into the water in the boiler in the form of heat. There is condensation in the steam pipes and cylinder; the exhaust goes out uuder pressure; there is friction at every bearing of every moving part of the engiue and of the shaft, and the screw has more or less "slip" in the water. Froude, long connected with the engineering department of the British naval service, estimated that only 37½ per cent of the indicated horse power of a marine engine got to the propeller. Mr. Secor says he can get rid of all intermediate mechanism between the points where his fuel is consumed and where his power is applied.

One is reminded by this system of the use of water jets for propulsion. Although there is on record an experiment which seems to be an exception to the rule, it has generally been found that water jets do not propel a boat as rapidly as a screw or paddles with the same power. But in such craft there is, in addition to the various other energy-wasting appliances interposed between the fuel and the point where the final work is done, one or more pumps to create the jets; and these alone absorb half of the power delivered to them. The yielding character of the medium into which this stream is ejected permits the explosion to be made with less of a shock than is observed in a gas engine, where the piston's motiou is regulated partly by the flywheel aud "load." That shock, by the way, represents another element of waste. Already Mr. Secor has got rid of vibration, and he hopes to reduce the uoise of explosion—already trifling—to an almost imperceptible minimum. Gas engines have already been much improved in the latter respect; and it is reasonable to expect even less annoyance, in proportion to the charge used, from his firing tube.

This plan, as has been remarked already, resembles that on which a rocket works, except that the discharge is intermittent. Mr. Secor claims that a rocket has the efficiency of 90 per cent and his firing tube about 80. These latter figures he reduces to 56 by allowing for wastes by causes not named. Of course, if anything like this were actually realized in practice he would have unusual efficiency, and it may be that he has overlooked or miscalculated some source of loss. The lateral expansion of his gas, for instance, after emerging into the water, must of course, impair the rearward thrust. In this respect, it may be, a jet of incompressible water might act differently from a volume of elastic gas released from high pressure. However, Mr. Secor is an intelligent, unusually sensible man, well read in the science of thermo-dynamics, and distinctly superior to the "crank" class of inventors; and his methods of iuvestigation and experiment are worth notice.

Weights of Sheet Metal.

It will be interesting, says the *Iron Trade*, to those who have anything to do with sheet iron, boiler plate, or similar material to have an easily remembered rule for finding the weight per square foot of material they are working with. The fact that a square foot of iron plate, one-eighth inch thick, weighs almost exactly five pounds, forms at once a basis for a very simple and easy rule. As a square foot of iron, one-eighth inch thick, weighs five pounds, a square foot of one-fourth inch iron will weigh ten pounds, and we can say that the area of any sheet iron (or iron plate) in square feet, multiplied by the thickness in one-eighths and multiplied by five, will give the weight of the piece. There is a piece of tank iron $\frac{5}{16}$ inch thick, 3 feet wide, and 5 feet loug; how much does it weigh? The area will be 3 feet by 5 feet, or 15 feet square. Now, how mauy eighths is $\frac{5}{16}$ inch? Since $\frac{1}{8}$ inch equals $\frac{2}{16}$ inch, and two is contained in five $2\frac{1}{2}$ times, we say $\frac{5}{16}$ inch equals $2\frac{1}{2}$ eighths, or $2\frac{1}{2}$ times 5 pounds equals $12\frac{1}{2}$ pounds per square foot, and as there are 15 square feet we have 15 feet by $12\frac{1}{2}$ feet equals 187.5 feet. Where the thickness is even eighths of one inch, it is much simpler, but even this is not a hard thing to do as shown. If it is desired to use this rule for other than iron, we simply find the difference between the weights of the two metals per cubic inch and find what a square foot one-eighth inch thick will weigh, then work as shown above.

In a paper on "Face-Hardened Armor," contributed to the proceedings of the United States Naval Institute by Lieut. A. A. Ackerman, it is stated that greater care has to be taken in selecting ingots for harveyized plates than for ordinary oil-tempered plates. The plate, before harveyizing, is forged to nearly the finished dimensions and rough-machined, an allowance being made in its thickness to compensate for the oxidizing of the back in the cementation furnace. Allowances are also made in length, width and the angles of the sides with each other and the faces, it being generally found that all faces become convex. These allowances vary with every thickuess and shape of plate. The strips that are to remain soft for bolt-holes, etc., are then marked off, aud in the furnace are in contact with sand instead of the carburizing material. All the remainder of the face, with the exception of a narrow strip arouud the edge, is then cemented. Plates of small curvature are bent before carburizing, while, where the curvature is greatest, the bending is done after this, but before tempering. In this case, superficial cracks sometimes appear. Whatever the shape of the plate, a bed to correspond is swept in the sand on the floor of the furnace, and upon this is placed a six-inch layer of Harvey's mixture, consistiug of about equal parts of animal and wood charcoal. After placing the plate in the furnace, its sides and back are covered with sand, rammed down, and then by a layer of firebrick, and the temperature raised to from 2230 to 2500° Fahr. When the operation is complete, the plate must be cooled slowly. The plate is then machined and bent to such a shape as will give the desired form after tempering, a powerful spray being forced on the highly heated plate from a number of small, evenly spaced jets.

The Railroad Kidney.

This complaint is uow recoguized by medical men. It is caused by an artificial stoppage of the pores of the skin, the dirt of the railroads being responsible for such stoppage. If any person will examine his hand after riding for two or three hours in a train—and this is especially true if he be perspiring—he will find his hand is dirty. But a closer examiuation will show the existence of a fine grime, the particles of which, so soon as the perspiration ceases, act as minute corks, stopping up the orifices of the pores. How deeply the grime works into the skin is shown by the fact that after a railroad trip oue washes one's hands two or three times before they become clean. It is this grime which produces railroad kidney. Of course it is not to be supposed that an ordinarily healthy person will contract this disease in any trip of a day or two. But where a person is already a sufferer from chronic disease of the kidneys, it is possible that a week on railroad trains would aggravate his malady to an appreciable extent.—Scientific American.

The 69th meeting of the American Institute of Mining Engineers will be held at Atlanta, Ga., beginning October 8, 1895.

Coast Industrial Notes.

—The Port Discovery, Wash., mill and 7,000 acres of lumher land is for sale.

—Nearly 1200 men will he employed at the Mare Island navy yard next month.

—Schaw, Ingram, Batcher & Co., of Sacramento, will shortly install a 26 H. P. engine.

—The Portland, Or., water committee has sold $200,000 thirty-year 5 per cent water honds.

—W. H. Birch & Co. are making two large hydraulic elevators for the Napa Insane Asylum.

—The Nevada City water works propose replacing 2200 feet of their eleven-inch pipe with fifteen-inch.

—The General Construction Company has a contract to huild water works for the town of Santa Clara, to cost $40,000.

—C. H. Evans & Co. are building a steam tug for Central America and complete hoisting works for the Pittshurg Co.

—The Western Manufacturing Co. are turning out some suhstantial machinery for the Usal Lumher Co., Mendocino Co.

—From Stockton southward are surveyed thirty-three miles of the route of the San Francisco and San Joaquin Valley Railway.

—The S. P. Co. is building an $80,000 wagon and railroad hridge across the Sacramento river at Sacramento, to be completed November 1st.

—A daily paper reports the sale of $500,000 6 per cent bonds S. P. R. R. of Arizona at par. Another daily paper asserts that 83 was the selling price.

—W. B. Carr has turned over to Tevis & Haggin all his interest in Kern county, receiving $1,000,000 and 10,000 acres of swamp land in Tulare county therefor.

—In the suit of the United States Government against the Southern Pacific, to ohtain possession of 700,000 acres in Ventura and Los Angeles counties, a decision against the railroad was made last Tuesday by the United States Circuit Court of Appeals, affirming the decision of United States Judge Ross.

—The famous Heidelherg tun, long the largest wine cask in the world, is now exceeded hy one at the Barton winery, at Fresno, which holds 2000 gallons more.

—The San Francisco Marine Firemen's Union reports the loss by death of thirty-one members during the past year. Nineteen members were drowned in the Colima wreck.

—A report prepared by a Poruvian commissioner shows "that, hy the guano contract, the Government has heen defrauded to the extent of more than £180,000. In twenty cargoes it lost 30,000 tons."

—The money is ready in London for the purchase of the Gila Bend or Wolfley, Arizona, canal and dam. A syndicate with a capital stock of £300,000 is organized, and sufficient suhscribed to redeem everything outstanding.

—Lumher freight rates are advancing. Puget Sound quotes: To Shanghai 52s 6d; to Cork 70s; to Sydney, 36s 3d; to Port Pirie, 42s 6d; to Valparaiso, 45s; to Payta, 47s 6d. The average rates to this city are $3.50 and $3.75.

—The sugar-beet crop in the southern part of Alameda county promises well. Two hundred carloads will he produced. The active season hegins ahout the 15th of Septemher. Fifteen cents per hour is paid instead of day's wages.

—L. S. J. Hunt, formerly one of the owners of the Seattle, Wash., *Post-Intelligencer*, hut now in the Orient, has secured from the Shanghai municipal council the right to construct an electric street-car system at a cost of $2,000,000 in gold. The overhead trolley system is to he used.

—All the grain-carrying vessels in San Francisco are chartered. Last year the disengaged tonnage at this time was 71,611 tons. There are now vessels on the way from San Francisco totaling a tonnage of 344,070, and more than half of it has already heen engaged.

—The total acreage of beets planted this season on the Chino ranch is 6720 gross, or ahout 6400 net. The Anaheim crop amounts to about 2700 acres, making in the neighborhood of 9100 acres to be worked in the factory this year. The Chino fields will yield an average of 12 tons per acre this year. If the Anaheim fields do as well, the factory will receive at least 100,000 tons.

—The first car of lumber for the new electric plant near Grass Valley has arrived there—the first of a shipment of sixty-five cars of lumher to be shipped by the Boca Mill Company. The electric plant, when completed, will be prepared to furnish electricity for light and power to run all the machinory of the mines in the neighborhood of Grass Valley and Nevada City.

—A City of Mexico dispatch says a concession has heen granted to a French company, with a capital of 20,000,000 francs, to introduce electric force into that city. The company expects to furnish 20,000-horse power, taken from the waterfalls in the State of Puehla, 125 miles distant. A German electrical concern is also developing plans for supplying electrical energy to the Mexican capital.

—J. Treadwell, R. D. Fry, E. B. Poud, J. D. Brown and B. M. Bradford have incorporated here, capital stock $500,000, of which $30,000 has heen suhscribed, to construct a railroad from a point at or near the coal mines of the San Francisco and San Joaquin Coal Company in Alameda county to a point at or near the city of Stockton in San Joaquin county. The estimated length of the road is thirty miles.

—E. P. Connors has discovered a ledge of soapstone at Centerville, Shasta Co., four feet in width. Soapstone is used largely in the manufacture of paper. The output of this ledge can be placed on the cars in Redding for five dollars per ton. The present market price of soapstone is forty dollars per ton. Mr. Connors is trying to obtain contracts to furnish the paper mills of this State with all the soapstone they require.

—Labor Commissioner Fitzgerald of California has found proof that the majority of the Japs in the State are virtually slaves to the contractors. He will prepare a memorial to Congress asking for strict exclusion of the brownies. He will also open a free-labor hureau in San Francisco in July, amd is confident of finding work for a large numher of men. He likewise thinks that he can locate a good many men on wage-paying placer claims.

—The pilot chart for July of the North Pacific ocean gives a table of ocean distances, in which is shown that the route to Yokohama from the western terminus of the proposed Nicaragua canal is shorter hy way of San Francisco than hy Honolulu. The shortest practical route from Brito, Nicaragua, to Yokohama is 7141 knots; by way of San Francisco it is eighty-nine knots more, while by way of Honolulu the distance is 374 knots more than by San Francisco. The shortest practical route from Brito to Hong Kong is 8740 knots; hy way of San Francisco it is twenty knots farther, while that hy way of Honolulu is 368 knots more than hy San Francisco.

—The Lick trust, organized in 1875, is ended. The Society of California Pioneers and the Academy of Sciences, the residuary specified by James Lick in the original trust deed, will receive $600,000 each. The receipts of the trust have heen ahout $5,000,000 from the sales of real estate, stocks and honds and the collection of rents. Lick's trust doed bequeathed $1,941,000 worth of property for various objects. This property increased in valuation during twenty years nearly 100 per cent. The principal puhlic legacies in Lick's will were: Lick Observatory, on Mount Hamilton, $700,000; School of Mechanical Arts, $540,000; Old Ladies' Home of San Francisco, $100,000; Lick Free Baths, $150,000; monuments at the City Hall and the Park, $160,000.

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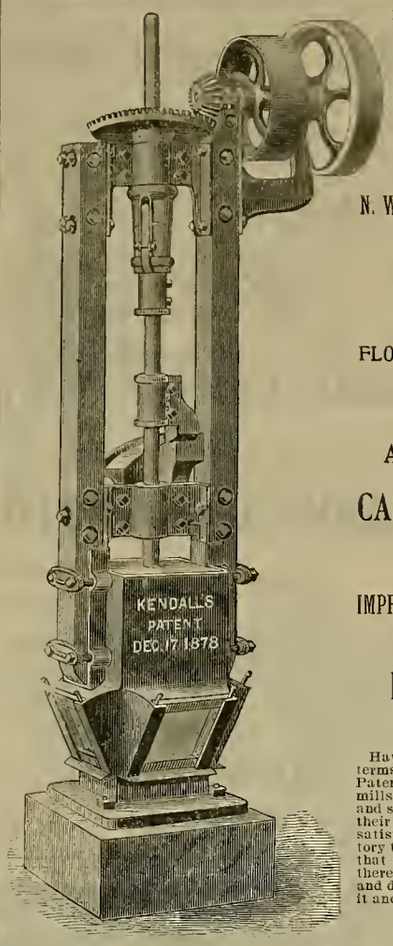

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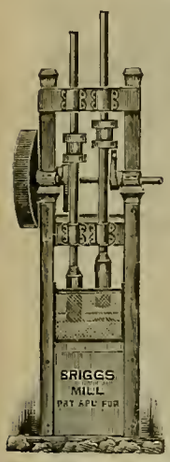

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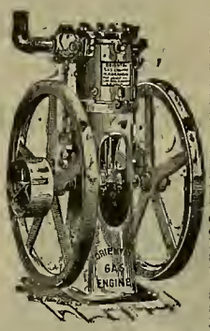

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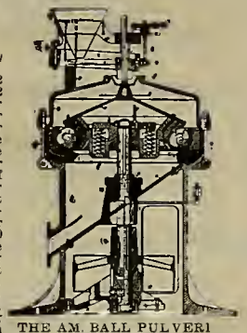
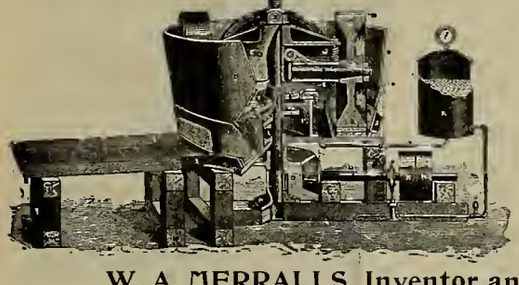
GENTLEMEN:—We purchased a No. 2 American Rock Breaker and a No. 2 American Ball Pulverizer from your company about one year ago. The latter part of April, 1893, we started up for regular work, since which time we have run both of said machines to the full extent of our demands and to our entire satisfaction. The first 700 tons of hard iron ore that we pulverized for paint purposes was ground without taking the Pulverizer apart, and without expending one dollar for repairs for either of these machines. Of the 700 tons spoken of, about 200 tons was Lake Superior Specular iron ore, containing some 70 per cent iron; a very difficult ore to pulverize. The remainder was a red fossiliferous iron ore, carrying quite a per cent of silex, which cuts out buhr-stones rapidly. We find that the steel balls, which were when new 5 in. in diameter, now caliper 4⅞ in., and are perfectly round and smooth. The grinding track shows very little wear, and the driving track shows LESS; in fact, the wear is almost imperceptible. These two machines crush and pulverize more than one ton per hour with LESS than 12 H. P. We do not know of any Crusher or Pulverizer that can compare with the output of these two machines in quantity, quality, small amount of wear and tear, and like power. In our opinion, you cannot recommend them too highly. Very truly yours,
CLEVELAND IRON ORE PAINT CO.



THE AM. BALL PULVERI
Morris Patent.

Merralls' Hydraulic Quartz Mill



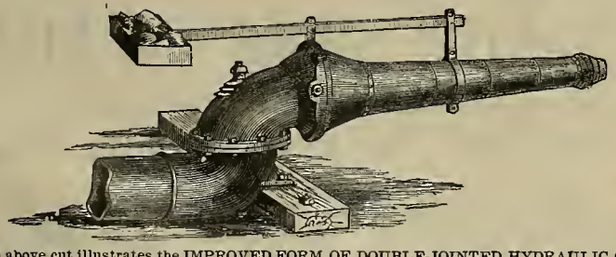
Superior to any other Wet Mill now in existence.

A PLAIN, CHEAP, PRACTICAL MACHINE

That will pay for itself in a short time by its very high percentage of gold saving.

W. A. MERRALLS, Inventor and Owner,
Room 12, Third Floor, Mills Building.....San Francisco, Cal.

IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

DEWEY & CO., 220 Market St., SAN FRANCISCO,
PATENT SOLICITORS.

ESTABLISHED 1863

Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us to give advice which will save inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 220 Market St., S.F.

The Pelton System of Power

Represents the highest development yet attained in water wheel practice and affords the most simple, efficient and economical means of utilizing water for power purposes.

Six Thousand Wheels Now Running,

Aggregating over 400,000 horse power. Adaptation made to all conditions and every variety of service.

Electric Power Transmission.

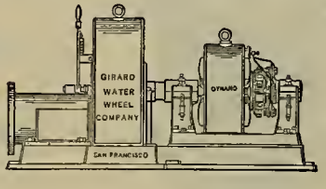
PELTON WHEELS are the recognized standard for electrical work and are running a majority of the stations of this character in all parts of the world.

Catalogues furnished upon application. Address

THE PELTON WATER WHEEL CO.,

121 MAIN STREET, SAN FRANCISCO, CAL.

American Girard Water Wheel.



Adaptable to all heads between 30 feet and 2000 feet, particularly where economy in the use of water and fine regulation are desired, as, for instance, the operation of electric dynamos.

Girard Water Wheel Co.,

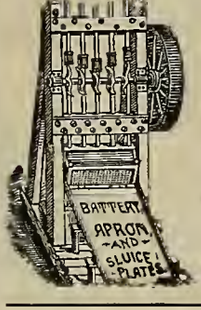
34 MAIN STREET, - - SAN FRANCISCO, CAL., U. S. A.

WATER WHEEL

CASCADE WATER WHEEL

Adapted to all heade, from **30 FEET TO 2000 FEET.** Our experience of **33 YEARS** in the water wheel busineee enablee ue to euit every requirement of water power plante. Send for illuetrated pamphlet. This new wheel hae given an unequaled Economy in Water.

JAMES LEFFEL & CO. Springfield, Ohio, U.S.A.



To Gold Miners!

Silver Plated Copper Amalgam Plates
For Saving Gold.

GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS,
653 and 655 Mission Street, San Francisco, Cal.
Telephone, Main 5931.

E. G. DENNISTON, - - - - - - - - - - Proprietor
Every description of work plated. Send for Circular.

Thomas Price & Son,
Assay Office, Sampling Works
And Chemical Laboratory.

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WIRE ROPE
FOR ALL PURPOSES
WIRE ROPE TRAMWAYS.
IRON & STEEL WIRE
TRENTON IRON CO
TRENTON, N.J.
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COOPER HEWITT & CO. 17 BURLING SLIP
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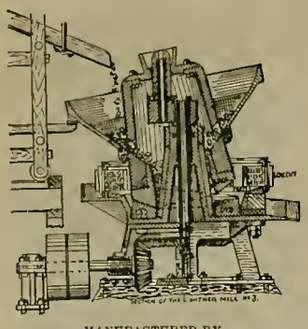
AGENT IN SAN FRANCISCO:
NEWTON M. BELL, 109 California Street.

A Full Assortment of Wire Rope for Mining Purposes carried in San Francisco.

THE LIGHTNER QUARTZ MILL.
Something New, Good and Cheap.



MANUFACTURED BY
WM. H. BIRCH & CO.
Also Manufacturers of
Cary Steam Pumps, All kinds of Mining Machinery, Boilers, Engines, Ore Buckets, Ore Cars, Cages, Hoists, etc.
119 Beale St., San Francisco.

Hoskins' Patent Hydro-Carbon Blow-Pipe and Assay Furnaces.

No dust. No ashes. Cheap, effective, economical, portable and automatic.

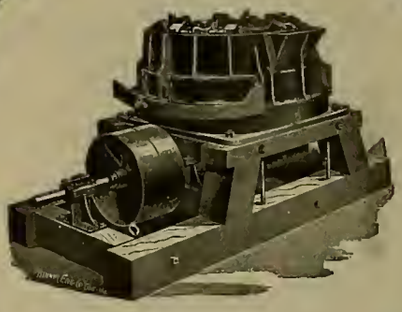
SEND FOR PRICE LIST TO
W. HOSKINS, 81 South Clark St., Room 51, CHICAGO, ILL.

LIGHTNING / LARGEST WELL MACHINERY Works.
All kinds of tools. Fortune for the driller by using our Adamantine process, can take a core. Perfected Economical Artesian Pumping Gear to work by Steam, Air, etc. Let us help you. THE AMERICAN WELL WORKS, Aurora, Ill.; Chicago, Ill.; Dallas, Tex.

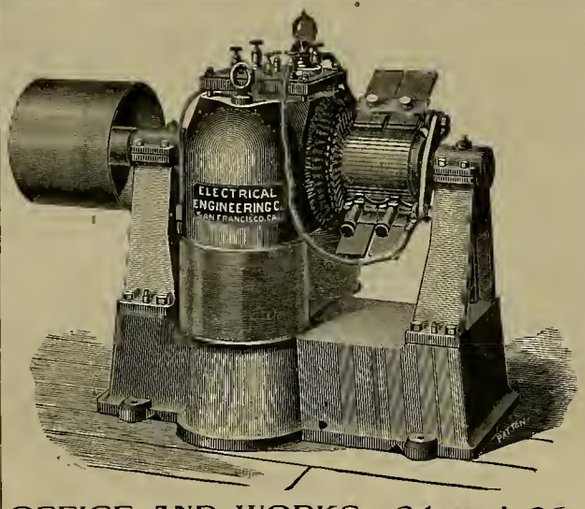
RUBBER STAMPS, Type Dates, etc. Catalogue Free. Novelty Stamp Works, Cleveland, Ohio.

Power, Mining, Milling, Smelting, Concentration and Leaching Machinery; Return Tubular and Water Tube Boilers, Corliss Engines, Jones' Mechanical Stokers, Hoisting Engines, Riedler Air and Gas Compressors, Riedler Pumping and Blowing Engines, Cornish Pumps, Roots Blowers, Copper Converters, Pyritic Smelters, Horseshoe Roasting Furnaces, Comet Crushers, Crushing Rolls, Stamp Mills, Shoes, Dies, Perforated Metals, Sectional Machinery, Huntington Mills, Frue Vanners, Bridgman Samplers, Concrete Mixers, Heavy Machinery and Mine Supplies. = = Write for Catalogues

FRASER & CHALMERS
CHICAGO, ILL., U. S. A. and
43 Threadneedle St., E. C., London, Eng.



Works at Chicago, Ill., U. S. A., and Erith, Kent, Eng.
Branch Offices: 2 Wall St., New York; City of Mexico, Mex.; 527 17th St., Denver, Colo.; Helena, Montana; Salt Lake City, Utah.

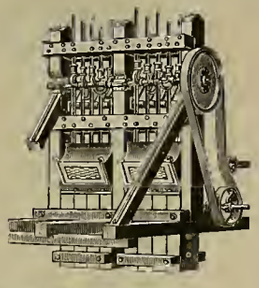


Electrical Engineering Co.,
MANUFACTURERS OF
Dynamos and Electric Motors
FOR THE TRANSMISSION AND DISTRIBUTION OF POWER.
Electric Power Apparatus
FOR
Quartz Mills, Hoisting, Pumping, Drilling,
And all Mining Work where Long Distance Transmission is required
A SPECIALTY.
OFFICE AND WORKS: 34 and 36 Main Street, San Francisco, Cal.

The Edward P. Allis Company, Milwaukee, Wis.
Established 1860. Reliance Works.

MINING, MILLING AND SMELTING MACHINERY.
Crushers, Rolls, Jigs, Concentrators,
Screens, Stamps, Pumps,
Compressors, Hoists, Boilers, Etc., Etc.
Reynolds Corliss Engines.
WORK THE BEST, PRICES THE LOWEST.

THE E. P. ALLIS STAMP MILLS,



The Best in the World.

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San Francisco, Cal. ..... 9 Fremont Street.
Butte, Mont. ..... 30 W. Granite Street.
Salt Lake City, Utah. ..... 73 So. Main Street.
Denver, Col. ..... 437 Seventeenth Street.
Minneapolis, Minn. ..... 416 Corn Exchange.
Chicago, Ill. ..... 509 Home Ins. Building.
Kansas City, Mo. ..... 43 Armour Building.
Pittsburgh, Pa. ..... German National Bank Building.
New York City ..... 26 Cortlandt Street.
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WRITE FOR OUR NEW CATALOGUE.

NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES
For Saving Gold
IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.
AT REDUCED PRICES.
Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.
San Francisco Novelty and Plating Works
Incorporated.
SEND FOR CIRCULARS.
68, 70 and 72 First Street, San Francisco, Cal.

Justinian Caire, Agent
521 and 523 Market Street, San Francisco,
—DEALER IN—
Assayers' and Mining Material.
—MANUFACTURER OF—
BATTERY SCREENS AND WIRE CLOTH.
—AGENT FOR—
Hoskins' Hydro-Carbon Assay Furnaces.

Market Reports.

The Markets.

SAN FRANCISCO, June 27, 1895.

Silver has lost a little ground during the week, hut the feehle fiuctuations daily quoted indicate nothing either way.

Officials of the Chinese legation say that the American capitalists who are negotiating in China to secure a loan of 300,000,000 taels, which China is ahout to pay to Japan, are by no means urging a vague or futile suit, and that they stand quite as good a chance of securing the loan as any other money representatives. There is much interesting speculation as to the result of the loan if it is secured hy the American parties. It is said the first result would he the shipment of an unprecedented amount of silver. But as China's bonds are payahle in gold, the ultimate result would be to hring hack gold for the silver paid to Japan. It is pointed out also that the interest on the entire loan will not exceed $5,000,000 annually, so that the Chinese customs receipts of $23,000,000 will readily meet the interest charges and provide a sinking fund for the redemption of the honds, which will probahly run for twenty years.

It is a fact not generally known that naval officers and crews in Chinese and Japanese waters on the Atlantic station receive their pay in Mexican dollars.

"Mexicans" is the term applied to them hy the naval officers. The paymaster of a ship makes a draft on a hanking establishment and receives "Mexicans" for the amount, which he locks in his safe to make his payments. In the Mediterranean French money is used almost exclusively. In South America it is usually American and English gold. In Europe, some years ago, American gold was looked upon with some disfavor, hut English gold was always popular. Now American gold, and even paper money, pass without difficulty. On the Asiatic station the "Mexicans" are purchased hy the paymaster at their bullion value and are paid to the officers and crew at the same rate, usually heing two dollars for every one due the men. The money usually being expended in those countries, the men want the kind that circulates, and "Mexicans" are the favorites, especially with the Chinese.

Officers who do not use their money while on the station generally prefer New York drafts.

Metals generally continue to advance. The copper producers say copper will he quoted at eleven cents before 90 days have elapsed.

J. W. Harrison writes relative to the local coal market:

There is a formidable list of engaged vessels from the colonies, which is continuously added to, until it has grown to be over 150,000 tons capacity. This, of course, has had the anticipated effect of a softening of prices, and of overloading all our principal consumers and wholesale dealers. These liberal shipments would usually have led to a demoralization of prices, hut in the present case very little unsold coal is being forwarded, sales being effected prior to cargoes being ordered. Our present stocks of Australian are very light, and not to exceed 13 cargoes can arrive prior to Septemher 1st, with about 35,000 tons, so our present quotations should maintain themselves in the interum. The last quoted freight rate from Newcastle is 12s per ton, and tonnage (disengaged) by no means plentiful.

The shipments of anthracite coal from Swansea this year will he largely in excess of any former one, and will he utilized for a numher of purposes, supplanting Wallsend. There are ahout 120,000 tons coal capacity already chartered, and the price is fully 25c per ton less than Australian. The yards here are carrying liheral stocks of British Columbia grades.

New York Metal Market.

NEW YORK, June 27.—PIG IRON—Scotch, 19@20c; American, 12.00@12.50c.

COPPER — Brokers', 10@10.50c; exchange, 10.60c.

LEAD—Brokers', $3.12½; exchange, $3.25.

TIN—Straits, 13.95@14.00c.

SPELTER—Domestic, $3.60.

New York Silver Prices.

NEW YORK, June 27.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	30⅝	66¼	10 50	....
Saturday	30¼	65¾	10 50	3 12½
Monday	30¼	66⅛	....	3 15
Tuesday	30⅛	66⅛	....	....
Wednesday	30⅛	66⅛	10 50	3 12½
Thursday	30¼	66¼	....	....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.85½
London Merchants	$4.87½
London Sight Bankers	$4.89½
Refined Silver, per ounce	66½c
Mexican Dollars, nominal	53c

San Francisco Metal and Coal Market.

ANTIMONY.

Per lh	—	@	10

COPPER.

Bolt	¼ & 5-16, 17c; ⅜ and larger,		16c
Lake Superior Sheathing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17

IRON.

American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00

STEEL.

English, lb	14	@	16

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00
Grata	7 75
Nanaimo	6 50
Gilman	6 00
Seattle	7 00
Coos Bay	5 50
Cannel	8 00
Egg, hard	12 50
Wallsend	7 50
Scotch Splint	7 50
Brymbo	7 50
West Hartley	8 75

TO ARRIVE—CARGO LOTS.

Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

ZINC.

Sheet	8¼@		

LEAD.

Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per hag of 25 lhs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do. " "			1 45

QUICKSILVER.

Home trade, per flask	41 00	@	— —

Mining Share Market.

SAN FRANCISCO, June 27, 1895.

The market opened with more strength and activity this week than has been evinced for considerahle time, and north end stocks were in demand. The Brunswick proposition has put some needed life into the street, in connection with the new deal and revivification of the Comstock Tunnel Co. Franklin Leonard, the president of that Co., who has been on the Comstock for the past week, arrived in San Francisco to-day (Thursday) to confer with mining men on future movements.

It is ahout decided that active work will begin on the Brunswick lode next week.

At the delinquent assessment sale of the Yellow Jacket on Wednesday but 420 shares, mostly halances, were sold for non-payment of assessment, the closest any assessment on that stock has heen paid up in many years. The next assessment falling due is the Hale & Norcross on the 29th. The decision has long been overdue.

The following illustrates the changes of the week:

MINES.	20	27
Alpha	....	$ 10
Alta Consolidated	$ 17	19
Andes	26	30
Belcher	39	40
Best & Belcher	47	60
Bodie	35	28
Bullion	11	11
Challenge	25	28
Chollar	60	59
Confidence	....	95
Consolidated California and Virginia	2 50	2 75
Consolidated New York	....	....
Crown Point	37	40
Exchequer	....	....
Gould & Curry	....	35
Hale & Norcross	89	95
Justice	....	14
Mexican	....	67
Ophir	1 45	1 60
Overman	19	23
Potosi	....	40
Savage	38	43
Sierra Nevada	64	60
Union	....	34
Utah	....	....
Yellow Jacket	46	46

San Francisco Stock Board Sales.

SAN FRANCISCO, June 27, 1895.

9:30 A. M. SESSION.

100 Alpha	10	100 H & N	95
200 Alta	19	500 Justice	14
200 Andes	30	100 Mexican	67
100 Belcher	40	100 Ophir	1 60
200 Best & Belcher	60	100	1 55
100	58	100 Overman	23
300 Bullion	11	100	22
250 Chollar	59	100 Potosi	40
250	58	500 Savage	42
100 Confidence	95	300 Sierra Nevada	60
100 Crown Point	40	100 Union	34
300 Caledonia	16	100	33
300 Gould & Curry	35	100 Yellow Jacket	46

SECOND SESSION—2:30 P. M.

500 Ophir	1 55	100 Crown Point	39
100 Mexican	66	100 Yellow Jacket	45
300 Gould & Curry	31	300 Belcher	39
200 Best & Belcher	57	50 Confidence	94
250 Con Cal & Va	2 70	100 Overman	21
100	2 75	100 Union	32
300 Savage	42	100 Alta	18
200	43	100 Caledonia	15
500 Chollar	58	600 Occidental	20
500 Bullion	11	200 Iowa	05
100 Potosi	37	850 Bodie	28
200	36	800 Golden Eagle	40
500 Hale & Norcross	95	100 Challenge	28
300	94		

W. J. ADAMS, E. M.,
PRACTICAL MINING ENGINEER.
Graduate of Columbia School of Mines. Expert on geueral mill work and amalgamation. Fifteen years' experience. Specialties: The sating of fine gold, erection and regulating of Frue vanners. Address, 132 Market St., Room 15, San Francisco, Cal.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Alpha Con, Nev	14	5c	May 23, Jun 27, July 18	C E Elliott, 309 Montgomery
Alta M Co, Nev	49	10c	May 6, Jun 11, July 2	J E Jacobus, 309 Montgomery
Best & Belcher M Co, Nev	58	25c	June 12, July 18, Aug 10	M Jaffe, 309 Montgomery
Bullion M Co, Nev	45	10c	June 12, July 17, Aug 7	R R Grayson, 331 Pine
Challenge Con M Co, Nev	19	5c	June 11, July 16, Aug 6	C L McCoy, Mills Building, City
Chollar M Co, Nev	40	25c	May 14, Jun 15, July 11	C E Elliott, 309 Montgomery
Gold Bar Cons M Co., Cal	1	2c	May 24, Jun 29, July 22	E C Godfrey, Crocker Building
Hale and Norcross M Co	107	20c	May 29, July 3, July 25	A B Thompson, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19, May 31, July 26	J Henry Smith, 431 California
Mexican G & S M Co, Nev	52	25c	May 13, Jun 17, July 10	C E Elliott, 309 Montgomery
Occidental Con M Co, Nev	19	10c	June 25, July 30, Aug 21	A K Durbrow, 309 Montgomery
Sonora Extended M Co, Cal	2	2½c	June 1, July 6, July 27	C A Stratton, 213 Jackson
Union Con	51	20c	June 18, July 19, Aug 15	A P Swain, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Best & Belcher M Co, Nev	M Jaffe, 309 Montgomery	July 8
Overman S M Co, Nev	G D Edwards, 414 California	July 11

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JUNE 18, 1895.

541,145.—PAPER WRAPPING MACHINE—J. Arnott, Jr., Comptonville, Cal.

541,261.—SWINGING WINDOW—C. M. Berry, S. F.

541,223.—DREDGER—A. F. Carroll, Portland, Or.

541,267.—CHANGE HANDLER—G. E. Crump, S. F.

541,345.—LIFTING JACK—J. W. Currier, Los Angeles, Cal.

541,318.—PAPER WRAPPING MACHINE—Davies & Thomas, Oswego, Or.

541,164.—JOINT PACKING—J. L. Holland, Nevada City, Cal.

541,328.—TIRE TIGHTENER—J. N. Jennings, Portland, Or.

541,983.—HARVESTER—A. J. Johnson, Arbuckle, Cal.

541,363.—MEASURING FAUCET—L. & V. Konopinski, S. F., Cal.

541,368.—PRESERVING FOODS — Leak, Hayford, Pfister & Meyer, S. F.

541,384.—NAPKIN HOLDER—B. F. Pascoe, Globe, A. T.

541,193.—EXCAVATOR—C. F. Warren, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Frederick Joubert, in the Joubert mine, near Oak Valley, Yuba Co., to impound tailings in an old pit and behlud dams in Willow Creek; from George Parent, in the Tippecanoe mine, near Camptonville, Yuba Co., to impound tailings behind dams in Spanish Ravine; from W. R. & M. J. Williams, in the Galena Hill mine, near Camptonville, Yuba Co., to impound tailings in an old hydraulic pit; from E. C. Cochran and Charles Turner, in the Atom mine, near Camptonville, Yuba Co., to impound tailings behlud dams in Williamson Creek; from William Wellman, in the Young's Hill mine, near Camptonville, Yuba Co., to impound tailings behind dams in a ravine; from M. V. Turner et al, in the Horse Valley mine, at Wood's Point, Yuba Co., to impound tailings behind dams in Horse Valley Creek; from Michael Cortez, in the Sailor Boy mine at Brandy City, Sierra Co., to impouud tailings behlud this Brandy City Co.'s dam, in an old hydraulic pit; from Fournier & Barrere, in the Charcoal Ranch mine, near Loganville, Sierra Co., to impound tailings behind dams on a flat; from D. O. Keeffe, in his mine near Loganville, Sierra Co., to impound tailings in an old hydraulic pit; and from the Plumas Imperial Gold Mining Co., in its mine near Quincy, Plumas Co., to impound tailings behind a dam in Rock Creek, gives notice that a meeting will be held at Room 92, Flood building, San Francisco, Cal., July 8th, 1895, at 1:30 P. M.

DIVIDEND NOTICE.

SAN FRANCISCO SAVINGS UNION,

532 California St., cor. Webb.

For the half year ending with the 30th of June, 1895, a dividend has been declared at the rate per annum of four and eight-tenths (4 8-10) per cent on Term Deposits, and four (4) per cent on Ordinary Deposits, free of taxes, payable on and after MONDAY, the 1st of July, 1895.

LOVELL WHITE, Cashier.

—EASTERN PRICES BEATEN.—

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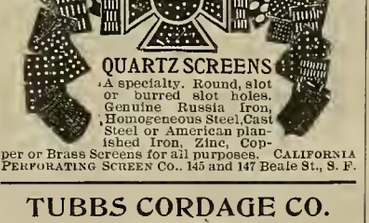

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Assessment Notices.

GOLD BAR CONSOLIDATED MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, La Porte, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 24th day of May, 1895, an assessment, No. 1, of Two Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of June, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 22d day of July, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

Office—38 Crocker Building, San Francisco, Cal.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of June, 1895, an assessment, No. 2, of 2½ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the corporation, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of July, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 27th day of July, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

CHALLENGE CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the eleventh day of June, 1895, an assessment (No. 19) of Five (5c) cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the secretary, at the office of the company, room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the sixteenth day of July, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the sixth day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

C. L. McCOY, Secretary.

Office—Room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the twelfth day of June, 1895, an assessment (No. 45) of Ten (10c) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No. 331 Pine street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the seventeenth day of July, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on WEDNESDAY, the seventh day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. R. GRAYSON, secretary.

Office—Room 20, No. 331 Pine St., San Francisco, Cal.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 29th day of June, 1895, an assessment (No. 19) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of July, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 21st day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

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GEO. TOURNY, Secretary.

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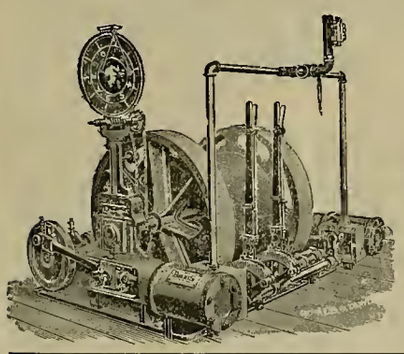

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